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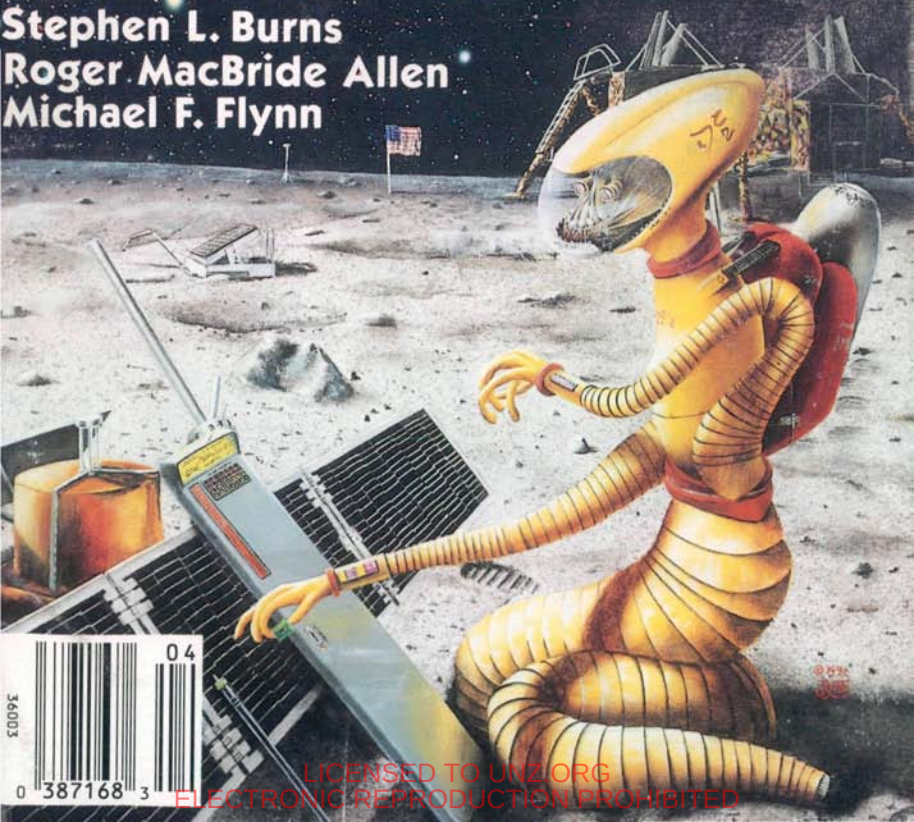
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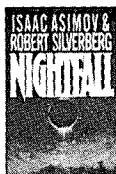
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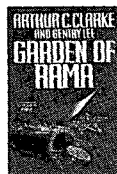
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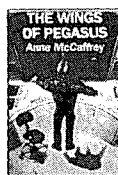
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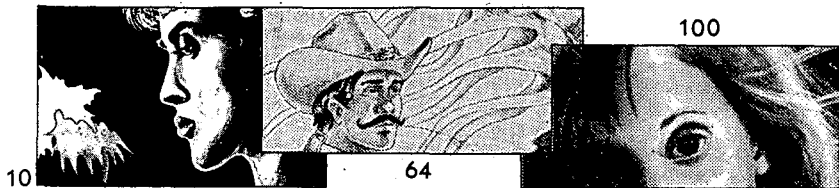
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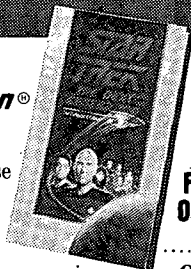
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Editorial

E PLURIBUS ZERO

Stanley Schmidt

While passing through Grand Central Terminal one morning last August, my eye was caught by a headline in *El Diario*, a Spanish-language daily tabloid published in New York City and widely distributed in the United States. "MEDICARE DISCRIMINATES," it shouted in 112-point type. A smaller subtitle elaborated, "Millions of elderly Hispanics deprived of information in Spanish." Curious as to why anyone thought they were being "deprived" of something I didn't realize they had a right to expect, I bought a copy of the paper and read the article inside.

As it turned out, the case was not as clear-cut as I first suspected. My initial suspicion was that this was just another manifestation of the current fad for "multiculturalism," for encouraging people to cling to their foreign ethnic roots instead of adapting to the culture into which they chose to move. What the headline seemed to hint at was peo-

ple who had voluntarily moved to this country, not bothered to learn its prevailing language, and expected to have all its services handed to them in the language they had brought with them. If that was the case, I didn't expect to be very sympathetic. Providing information about government services in additional languages would represent an extra burden on all taxpayers, and it was not at all clear to me that the government had any legal or moral obligation to assume that burden.

The article inside *El Diario*, brief as it was, made clear that the complaint about Medicare information in Spanish was more complicated. Realizing that made me a little more sympathetic—but only a little, and only because of the special circumstances of this specific case.

The objection I originally expected to have to the article I expected to find behind the headline depended partly on the cost of making translations and pub-

lishing separate editions of information already available in English. It turned out that those editions already existed, in Spanish—but *only* in Spanish. Why? Because Puerto Rico, as a “self-governing commonwealth associated with the United States,” had 421,000 residents enrolled in the Medicare program. Given that the United States government was playing a large role in the affairs of an island which has long been primarily Spanish-speaking, it made sense that information about programs affecting those residents should be supplied to them in the language they and their land had always used.

The complaint of the author of the *Diario* article (and the borough president of Manhattan, quoted in the article) was that even though the Spanish Medicare manual was already produced for Puerto Ricans, it was not available to Hispanics in the continental US—even though there were 20 million of them. On the face of it, this seems a highly reasonable complaint. If the book was already being produced anyway, why *shouldn't* it be given to all those Spanish speakers on the continent who would find it more helpful than the version they were getting now?

Granted, a few speakers of Abkhaz or Aranda might turn up to protest that

they're being discriminated against because the same isn't done for them. But so what? We could easily, and correctly, explain to them that providing the manual in their language would involve producing very small editions of additional translations, at great added expense. We could further explain that this would constitute an impractically expensive special treatment for them, while the Spanish edition is not such special treatment. It's simply providing the more useful-to-them version of the two that are already available.

But is that sufficient reason to do it? If so, should it be done indefinitely, or only on a temporary basis? I sympathize with the plight of immigrants who were already elderly when they came here and may no longer be up to learning a new language. I'm very tempted to say, sure, such people should have the Spanish manual since it's already available and can make their lives easier. But I'm uneasy about the idea of making that an open-ended policy, with the Spanish version available as a crutch to anybody from now on who would rather get his information the easy way than take the trouble to learn the generally accepted language of his new (and chosen) environment.

How about a compromise? We

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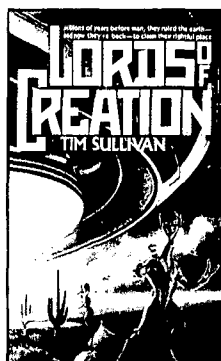
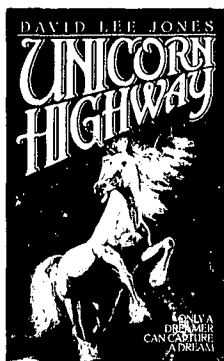
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To prevent misunderstandings, I must emphasize several points. First, I am *not* picking on Hispanics. My point has nothing to do with the fact that the people in my example speak Spanish. I would have the same reservations about providing special treatment to adopted citizens speaking *any* language.

Third, I am not especially concerned about Medicare. My concern is that, in the prevailing climate of extolling

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"multiculturalism," the demand for Spanish Medicare manuals could easily expand to demanding—and granting—all kinds of information in whatever language anybody happens to find most convenient.

My concern, in other words, is multiculturalism itself—or at least what has of late come to be understood by that word. My fear is that if too much emphasis is placed on keeping people comfortably and proudly ensconced in their own little ethnic niches, the cultural cement that enables the country to function as a unit will dry out and fall apart. What that implies for the country itself is left as an exercise for the reader.

That's why I have reservations about Spanish Medicare manuals, except as a stopgap measure justified by special circumstances. *That's* why I have reservations about "bilingual education," unless it's structured to make both immigrants and natives truly bilingual rather than allowing the former to avoid learning to talk with the latter.

The single most essential ingredient of that cultural cement is a shared language, understood and used by *all* the inhabitants of a civilization. It's fine for people to retain contact with their cultural origins, to remember where they came from and why, and to keep alive the language and literature and traditions of their ancestral homes. It's not fine for them to expect the government to do that for them, or to do it as a substitute, rather than a supplement, for becoming part of their adopted culture. In numerous very real senses, all of us who share a land share resources and problems. To *realize* that, to cope with

the problems and make the best use of the resources, we need a sense that "we're all in this together." To get that, we *have* to be able to talk to each other.

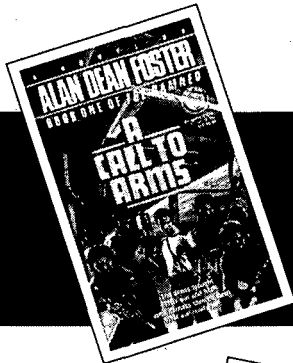
And to do that, we need one common language that all of us can use. Yes, you can find an occasional example of a country that somehow managed to make it work without one; Belgium and Switzerland come to mind. But it's far easier to find examples of places where the presence of many ethnic traditions and languages, without a strong shared heritage superimposed on them, caused serious problems. Consider, for example, the recent history of the Soviet Union and Yugoslavia.

The United States has been fortunate, so far. Despite a great many cultural inputs, it has had a common language and heritage which have done a better than average job of giving it a sense of community. Hence the motto on the money: "*E pluribus unum*," Latin for "One out of many." To use another well-worn metaphor, this country has often been referred to as a "melting pot," in which many disparate ingredients experience enough "melting" to bind them together.

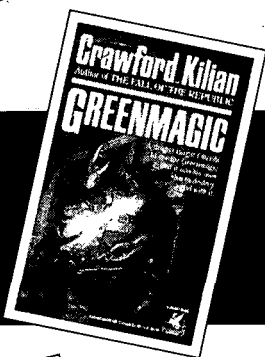
The recent fad for "multiculturalism" threatens to turn off the fire under the melting pot, so the ingredients just sit there as separate chunks with no melting and consequently no cultural coherence or integrity. If that happens, the country could easily become a collection of isolated little enclaves, with no unifying culture at all. Is *E pluribus zero* a desirable goal—or a danger to be guarded against? ■

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**ELVIS PRESLEY AND ROY ORBISON
GIVE BENEFIT CONCERT FOR IN-
JURED SPACE ALIEN.**

I read that over. Shook my head and deleted it from the screen. After a moment's thought I typed *SPACE ALIEN INJURED: ELVIS AND ROY GIVE BENEFIT CONCERT*.

That was more like it. It scanned better. Just plain Roy added a fillip of mystery. Roy *who*? Rogers? Orbison? Blount, Jr.? Aside from structure and style, I have this theory that people are more likely to believe things with a full colon—which is maybe why so many people had such a hard time swallowing all of Ronnie R's memory lapses in his memoirs and elsewhere.

One of my phones rang. Not the black phone that was my private line, or the red NONSNS (the name of my news agency, a major supplier to the supermarket tabloids) line. It was the headless Mickey Mouse phone. That could mean only one thing.

My country needed me.

Well, it could also mean that Dr. I. N. Epstein, head of a certain low profile government agency that I sometimes work for, was having trouble programming his VCR again. Although he is a former rocket scientist, Izzy is notoriously bad with machines. You might have said he had ten thumbs, machine-wise, except he lost three fingers of one hand to an Automated Teller Machine just a couple years ago.

I picked up the phone. "Hey Doc, having trouble taping the German Pleasure Channel again?"

I could almost see him blushing. I extracted my last pay increase by trapping him in his office and recounting

the twisted details of my brief, ill-starred fling with Tristan Shout, the Singing Contortionist, until he met my demands.

"No, I'm not—" A weary sigh "Bertha?"

I lit a fresh cigarette. It's a filthy habit, but it was the only way I could give up chewing tobacco. "What's up doc?"

Another sigh. "I have an assignment for you."

I smiled. It had been almost six weeks since my last assignment, and I was getting bored with cranking out several thousand words of whatever lunacy came into my head every day. The money was good, but there were times I worried about my sanity. I had enough copy written ahead to last until Bigfoot started doing Vidal Sassoon ads on TV.

"I don't know, Doc," I said, noisily shuffling some papers around on my desk. "I'm pretty busy."

"Well," he said after a moment's hesitation. "I suppose I could send Murtch. . . ."

This was a fairly lame effort on Izzy's part to jerk my chain. Not only was Murtch a cretinous sexist Nazi pig with bad breath and a gun fetish, he couldn't find his own useless self with both hands and a head start.

I let Izzy dangle a minute. A glance out the window showed me falling snow. The needle of the thermometer was pegged at 11°. Just about anywhere in the country was bound to be warmer than northern Minnesota in early March. Maybe I'd get a chance to work on my tan and bag a nice young life-guard to rescue me from those old winter blahs.

"What garden spot are you sending me to?"

"You'll take the assignment?"

His insistence that I agree to take the assignment before he told me the Event Location made my visions of a tropical paradise begin to frost over. But I needed a little action to keep from getting stale, and going on assignment had one other advantage. I could go off my diet.

"Yeah," I told him, "I'll take it."

"Great! You're going to Oregon. Gnatswarm, Oregon. To check out an incident of, quote, 'vegetative terrorism.' "

Even inside the lobbyist-choked marble halls of Washington, DC, very few people have heard of UPIGS, and quite a few of them think it has something to do with pork inspection. The agency is based in a small, shabby suite of offices down in the dungeon level of Foggy Bottom. Its funding comes from Congress under the heading of Miscellaneous Inexplicable Expenses. There are just over a dozen permanent staffers—researchers and readers mostly.

All the field work is done by an odd assortment of Specially Deputized Investigative Consultants, most of us with backgrounds in science and/or journalism, and enough law enforcement training to keep us from shooting or arresting ourselves.

UPIGS—The *Unusual Phenomena Investigation Service*—was formed during the Carter administration, soon after the president was allegedly attacked by a Violent Giant Aquatic Bunny. Maybe you remember the incident. It was in all the papers. Some of them, anyway.

That event raised a lot of questions. Was it maybe a *Cuban* bunny? Or *Iranian*? Was it some sort of mutant whose mother had eaten carrots contaminated with toxic/nuclear waste, and if so, should we expect more of them, knowing how bunnies are? Was it some desperate Space Alien, only trying to talk to our Leader? Or was it nothing more than a renegade Duracell toy?

Those questions demanded *answers*.

But the secret service pulled the wires out of their ears and refused to hear anything more about the affair. The FBI didn't want anything to do with the matter unless it could be proved it was a *Red* rabbit. The CIA couldn't touch it because it was a domestic matter—or at least that was their story and they were sticking to it. Fish and Wildlife weren't equipped for that sort of investigation, although they did offer nets, dart guns, and the name of a good taxidermist.

So a special investigative unit had to be put together to deal with the matter. UPIGS was born, cut its teeth on the Bunny Event, and soon after found a place for itself near the bottom of the bureaucratic food chain.

The Service came close to losing its minuscule funding during the Reagan years. But the *real* Star Wars saved it. Certain key people around the president became convinced that the Soviets were trying to warp the Course of the Ship of State toward the Shoals of Disaster by altering the orbits of the planets, thereby throwing off Crucial Strategic Horoscopes. Who did they call?

America is a big country. Inexplicable things happen all the time, and I'm not just talking about Madonna's popularity or Dan Quayle's vice presidency.

More often than you might think things occur that are so bizarre, unbelievable, or off the wall that they fit in the normal channels like Nemo's giant octopus in a file cabinet. When that happens, UPIGS swings into action.

My name is Bertha D. Nation. Lineal descendant of the legendary Carrie Nation. Only daughter of Historian Desi T. Nation and neo-Beat poetess A. Lee Nation.

I'm not going to tell you that America should sleep easy knowing I'm on the job. But if what you want is the most bang for your tax buck, I like to think I deliver.

I reached Gnatswarm at about nine the next morning. I had spent a long night on a variety of planes of ever-diminishing size, culminating in the chartered two-seater which had deposited me at the small, single-runway airstrip just outside of town. I was rested and ready to go because I tend to sleep while flying. That's the main reason I never quite got my pilot's license.

If you look at map of Oregon you will find big green areas where you almost have to use an electron microscope to find the roads. Gnatswarm was dead in the middle of one of them.

It was sunny and in the mid-fifties when I arrived, which felt positively Tahitian after Minnesota. There was grass on the ground and leaves on the trees. Unfortunately there was no airport taxi service. I hitched a ride into town with a talkative old duffer named Eli, the airfield's night watchman.

The town had only one motel that remained open all year round, a former Howard Johnson's now called the

Stump Palace. The service had already made a prepaid reservation in my name. I lugged my luggage to the front desk, dumped it on the floor, and waited to be noticed by the man on duty behind the desk.

I should have been noticeable, even if I hadn't been the only other person in the lobby. I'm a big girl, standing a bit over six feet tall in my ratty pink hi-tops, and I was wearing a neon orange down ski jacket that gave me the build of a Floridian parade balloon. My short auburn hair was sticking up every which way from sleeping on the plane(s) and riding into town in a topless jeep.

It might help you Crayola in your mental picture of me if I told you that more than one person has said that I look like Susan Sarandon on steroids. Or it might not.

"Excuse me," I said, "You have a reservation for Nation? Bertha D. Nation?"

The man behind the front desk was a beaky, balding little Frenchman with a thin pencil moustache, and the few strands of hair he possessed debonairly greased back across his pate. His name tag identified him as Mr. Phillippe Fromage. He finally deigned to acknowledge me with a sneering, slantwise look.

I recognized him immediately. I'd met his kind in a hundred hotels and restaurants. Smug, snotty, and supercilious. Utterly convinced of his own obvious superiority and your hopeless inferiority because he is French and you are not.

"Bertha D. Nation, hah? Is zis ze fonny made-up name, perhaps?"

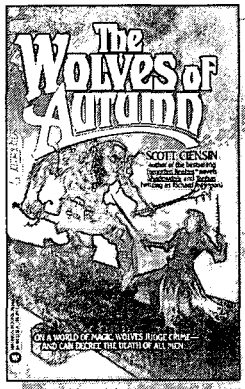
I smiled at him, considered turning



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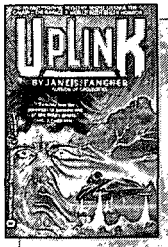
A WORD FROM BRIAN THOMSEN



There is always a sense of mythic history in quest fantasies. Just as America had the heroic plainsmen such as Daniel Boone and Davy Crockett, and the Anglo-ogres of Lord North and George III, fantasies have a backstory that helps you understand

from whence the characters have come. In **THE WOLVES OF AUTUMN**, it is the unlocking of these secrets of the past that provides the all-essential quest...and, as with our present, to forget the sins of the past is to condemn one's self to repeat them. Next month we'll also journey to the past, but somewhat more reluctantly—ask me about it.

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his little mustache into ear hair, but not wanting to discourage prompt room service. Besides, I wanted to keep a low profile. "Would you like to see some ID?" I asked sweetly.

A gallic sniff. "If you puhleez."

"No problem." I started emptying my purse onto the counter. The first thing I pulled out was my trusty Japanese steel combat knife. I stuck it in the register book. Point-first, of course.

The next thing I dug out was a pair of handcuffs. I tossed them onto the desk. Then a sextet of condoms. A hand grenade, sans pin, frayed rubber bands holding the handle shut. A ring of keys. A furry hairbrush. A necklace made from human teeth.

—I have this thing for souvenirs.

Mr. Fromage was staring at the objects before him in frog-eyed dismay, his complexion gone the color of Brie. "I gotta clean this damn thing out someday," I told him apologetically. "But don't worry, my wallet's in here *somewhere*."

Next out onto the counter was a snub-nosed revolver and a box of spare bullets. A tin box of Midol. A can of Mace. Two spare packs of Luckies. A Pez dispenser. Wirecutters. A quilted tampon pouch full of lockpicks, and finally my white alligator hide wallet—a little something I picked up on a trip to the New York City sewers.

I flipped the wallet open. On one side was a big gold badge bearing the legend *Special Investigator*. On the other was a laminated plastic Federal ID graced by my smiling face.

"See? Bertha D. Nation. Age: 39. Eyes: Hazel. Height: 6'1½". Weight: 170." I snapped the wallet shut a nose

hair short of his honker, letting my smile grow even wider. "Fuse: Short. Tendencies: Violent. Need any more identification?"

"Sign here," he squeaked, pointing a trembling finger at the skewered register.

The first thing to do with a hotel room is make it livable. The framed print of big-eyed children made a passable dartboard. I put my trusty laptop on the dresser, along with a few other necessities. Since I hate living out of a suitcase, I dumped my clothes onto the chair and all over the floor. That last touch made the room feel almost like home.

After a quick shower I changed into a pair of baggy grey parachute pants and a purple Banzai Institute (*Remember, no matter where you go, there you are.*) sweatshirt. Then I grabbed my purse, a light leather jacket, and my camera bag. So equipped, I headed out to see if the Gnatswarm Event was worth the trip.

Mr. Fromage ducked down behind the counter when I passed through the lobby. I was beginning to like the hotel.

I stood on the wet sidewalk across the street from the Event Location, a place called the Stump Tower. I lowered my battered Nikon and let it hang from its strap. I lit a cigarette, and I know I was wearing a bemused expression. You would have, too.

The Stump Tower wouldn't have been hard to spot even if downtown Gnatswarm hadn't been the size of your average shopping mall, and the building one of the tallest in town.

The Tower by and of itself was unremarkable enough. It was one of your

basic industrial-looking office buildings; an uninspired five story concrete and glass box in the center of a wide plaza. You could see buildings just like it in every city of every country in the world—not that you'd want to bother.

One thing set the Stump Tower apart from its unaesthetic brethren. That was the landscaping.

Forty- and fifty-foot trees of several kinds covered the whole plaza, their crowded upper branches forming an impenetrable canopy through which only a part of the Tower's top floor was visible. Smaller trees, shrubs, and other plants filled every space below, spilling over the concrete wall around the plaza. The building itself—what could be seen of it—was wrapped in a solid coating of leaves and vines. All told the place looked like a mutant monster Chia Pet.

I stood there listening to a rising and falling whine coming from somewhere inside the anomalous wilderness. It seemed to be growing louder. Sure enough, a couple minutes later a grim-faced man in a security guard's uniform fought his way out of the foliage and onto the sidewalk across from me. He wielded a gas-powered weed-whacker like a nightstick in a sixties demonstration.

I crossed the wet street, stepping around the deep puddles left by three days of rain. A "three-day frog-strangler," to quote my ride into town. The guard was a big, rubbery older man with a double chin and a drinker's rugose nose and cheeks. His uniform was so covered with shredded leaves and spattered sap it looked like camouflage. He saw me and shut the weed-cutter down.

"Isn't this the Stump Tower?" I

asked.

The guard sighed. "So far." He looked me over with an efficient impersonality that made me willing to bet he was an ex-cop. "You a lumberjill?"

I smiled. "No, I'm a Scorpio. I have an appointment to see Mr. Stump."

"Oh." His gaze strayed past me, a wistful look creeping into his face. I turned to see the object of his desire. It was a doughnut shop. That confirmed my guess that he was an ex-cop.

He sighed and squared his shoulders. Duty called more loudly than doughnuts' siren song. "I'll take you in." He held out the weed trimmer. "Here, you hold my whacker."

I batted my eyes at him. "I hardly know you, sir!"

"Cute," he growled, thrusting the machine into my hands. Then he hauled a big machete from the sheath clipped to his belt. "Follow me and stick close."

He plunged back into the greenery where he had come out before, hacking and slashing at the growth encroaching on the narrow trail he had cut. Before we had gone ten feet, the street was completely lost to sight.

I was *deja-vued* back to '72, and my six-month tour as a photojournalist in Vietnam. This rampant vegetation seemed to be growing with that same feverish energy. It was almost as if it had *exploded* out of the ground. The flagstones had been heaved—maybe even flung—every which way. The broken ground was literally bursting with green. The plants weren't tropical but it sure felt like the jungle.

"This is one helluva landscaping job," I told the guard as he chopped a wider path before us. "Is your gardener

on medication?" He waved through a clump of what would have looked like crabgrass if it hadn't been waist high.

"Landscape job, my ass," he huffed. "When I came in to open up the building two days ago I found this freakin' jungle already half grown. It just happened, like overnight."

"You mean there was nothing at all growing here before that?" We passed a stone bench that had been knocked over by a marijuana plant with a trunk the size of my arm. My escort gave it a withering look.

"They was some, whatyoucallem, geraniums in a flowerbed." He waved his machete off to the right. "Over that way. They're the size of freakin' apple trees now." He shook his head. "It's goddamned weird is what it is."

I took a deep breath, savoring the earthy aroma of this inexplicable jungle and feeling my sap rise. I plucked a blossom from a flowering bush beside the path and sniffed its perfume.

"It sure is, my friend." I tucked the flower behind my ear.

The guard hacked his way through a final wall of shrubbery. Like centuries-lost Mayan ruins in the deepest jungle, the vine-encrusted glass front doors of Stump Tower suddenly appeared before us.

I had learned quite a bit about Levi Stump III, owner of Stump Tower, Stump Forest Products, and at least half of the other businesses and properties in town from Eli, the old night watchman at the airstrip. He had been a talker.

Stump had been born with a silver chain saw in his mouth. His keystone business was Stump Forest Products,

which had been founded in the depths of the Great Depression by his grandfather, Levi Stump I. The elder Stump had seeded his fortune by impregnating and marrying the "hossfaced" spinster daughter of Skeeze Nickle, who not only owned the area's only bank, but was also the Gnatswarm County Supervisor and Tax Collector.

Soon after Stump had begun buying up condemned and foreclosed properties for a penny on the dollar, logging them off, and turning the logs into lumber in a mill operated with convict labor provided by a cousin who became the county sheriff after the incumbent had to move away. He somehow lost his house and land because of mortgage payments and delinquent taxes. Go figure.

Levi the second had been too soft-hearted—and too honest, according to my ride—to continue his father's business practices. He had taken over the company at age twenty, right after the old man died in circumstances involving large amounts of rye whiskey and three generously endowed young women of dubious reputation and means. This Stump had endowed a library and a hospital, started a scholarship fund, cut profits by implementing measures that would now be regarded as environmentally responsible, and even let his workers unionize.

He married late, and his wife died bringing Levi III into the world.

Levi Stump III was a chip off the original block. At age twenty-two he took his MBA, and three years later he leveraged his father out of control of SFP and began remaking it in his own image. By age thirty-three he had tri-

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pled SFP's corporate assets, multiplied the profits tenfold, broken the union, taken a stranglehold on the local government and economy, ruined his competitors, and just been an eighties kind of guy in general.

A short, chubby, pink-faced little man with curly blond hair, a weak chin, watery blue eyes and the busts of several runt conquerors scattered around his office, he was the Big Frog in the Gnatswarm Pond. According to Eli he had a thirty-acre estate, five racehorses, four BMWs, three offshore accounts, two limos, his own personal Lear jet, and several state and local politicians in the vest pocket of his perfectly tailored Italian silk suit.

At the moment he was not a happy man. One reason was because the command center of his empire was under seige. The vines wrapping the Tower were invading through every vent and window, making the lower floors all but impassable. Only the top floor was free of the tough tendrils of questing green. Secretaries armed with pruning shears patrolled the halls. The stench of weed-killer filled the air.

His office took up half of the top floor. Normally the floor to ceiling windows made him Lord of All He Surveyed. Now all that could be seen through the gaps in the vines were treetops.

The provenience of my assignment was that he had called his pet congressman demanding that the FBI be immediately dispatched. The bureau had taken one look at the report of a building assaulted by vegetables and promptly dumped the matter in UPIGS' lap. You know the rest.

Stump had taken one look at the government's response to his demand, namely me, and been bitterly disappointed. Well, so was I. I had expected Paul Bunyan, not Pinky Bunion.

"You're a woman," he informed me when I sauntered into his office, staring at me in pop-eyed dismay.

I shrugged and sat down. "I know. I've tried to quit, but I just *can't*." To make him feel better I added, "I drink beer right out of the can, if that helps. Don't shave my legs either."

Stump's nostrils flared and his fat little mouth tightened prissily. "Have you arrested Plantz yet?"

"Not, to the best of my recollection, ever—though I have seen quite a few of them." I scratched my chin thoughtfully. "Even if I did arrest them I'm not sure it'd hold up in court. I mean, how could you know if they understood their rights?"

"This is no joking matter!" Stump snapped, his voice rising. "Plantz is a *terrorist*! He must be *stopped*!"

"You're saying these plants are a person?" I said, glancing out the windows nervously. "Like the Jolly Green Giant or something?"

"*Plantz*!" Stump squalled in exasperation. "Dr. Forrest Plantz. The anarchist responsible for this—this—" He waved his little pink hands in the general direction of the vine-swaddled windows. "I told all of this to the FBI agent who called to make your appointment, some Jew named Epstein."

"Actually he's a Unitarian," I told him. "And we're not the FBI. We won't even let the cleaning lady use a Hoover vacuum."

Stump's shiny pink face was growing

pinker by the moment. "What the hell's the matter with you? I don't want dumb jokes, I want *action!* I'm telling you Plantz is behind all this!"

I stared at him. "Now why did you have to go and tell me that? Now you've taken all the *mystery* out of everything! There's nothing fun left for me to do!"

"You can *find* Plantz!" Stump shrieked, rising to his full 5'6", and turning so vividly pink I had to wonder if flamingo was a color. "You can *arrest* him and bring him back here to be dealt with!"

"I guess so," I muttered pettishly, crossing my arms and thrusting out my lower lip. I sighed. "What would I be arresting him for? Overzealous use of Miracle Grow?"

Stump gave me a gimlet-eyed look that I've seen before. It was that *Once this is over I'm going to see to it that you're fired, bitch*, look. I was shaking in my sneakers. Better men than this little twerp had tried. In fact, my old buddy Sununu still turns the color of an eggplant and nearly swallows his tongue every time my name is mentioned.

"I fail to understand your attitude—" he began coldly.

"Touch of PMS."

"But Forrest Plantz is a *criminal*. For one thing, he's guilty of industrial theft. He works for me, so whatever he used to create the mess outside is mine. Next add terrorism and blackmail."

"He's made demands?"

He smote the desk with his fist. "Damn right he has! He called me yesterday to tell me that this is only the beginning if I don't leave the Kilmer Tract alone. He'll do the same thing to

my mills and equipment yards."

I lit a cigarette, ignoring the *Thank You For Not Smoking* sign on his desk. If I want thanks I give a quarter to a bum. "Kilmer? As in Joyce?"

Stump gave me a blank look. "What the hell are you talking about?"

"Poetry." Thanks to my mother I can recite yards of the stuff. Maybe Stump ought to hear *Ozymandias*.

"Well, I'm talking about *money*. The Kilmer Tract is almost eighteen square miles of forest deeded over to the government in the late sixties by some rich old bag and her hippie grandson. It was supposed to be some sort of people's park or some damn thing. I've finally secured management rights."

"Management?" I prompted.

Stump sat back down, trying to look like the cool and unflappable young tycoon. It was a nice try, anyway.

"That's my business," he said briskly. "The Kilmer Tract has some of the last virgin redwoods up for grabs in this state. It also contains extensive stands of madrone, tanbark oak, and incense cedar—all fairly rare woods these days—not to mention several hundred million board feet of prime fir and hemlock."

I got it. Management as in cutting. The Homelite School. "Now Plantz is trying to stop you."

"Isn't that what I've been trying to tell you?" His face didn't so much harden as pucker. It made him look like a constipated Kewpie doll. "Now I see that he was one of the masterminds behind the forces opposing me. It's time to punch his ticket." He gave his watch—a gold Rolex, of course—a significant glance. "You know what you

have to do. My secretary will give you Plantz's file on the way out."

I had been given my orders and now I was getting the bum's rush. Well, I was sick of looking at him, too. Something about him gave me an intense craving for shrimp cocktail. I stood up.

"So you want me to bring Plantz in."

"Now that Plantz has showed his hand," Stump replied coldly, "I want you to chop it off." His lips peeled back from his teeth. "If you think you're up to the job." Oh my, a challenge!

I gave him my sweetest, most mysterious smile. "I never quite know what I'm up to until I've already done it."

It's true, too. That's why I love field work so much.

Less than ten minutes later I walked into the doughnut shop across the street from Stump Tower and slid onto the stool next to the security guard I'd met earlier. He spared me a disinterested glance, then went back to contemplating his coffee. Sometimes a pretty face just can't compete with caffeine.

"Nice town," I told him, a truly scintillating conversational opener.

"I guess." The waitress came over. I ordered coffee, and since they didn't have shrimp cocktail, decided to exercise my dietary liberty with a nice glazed doughnut. Then I swiveled my stool so I was facing the guard. *Hey sailor. Come here often?*

"Can you recommend a good florist?"

He frowned and peered at me sideways out of one eye. "A florist?"

"One that delivers."

He eyed me expectantly, raising his coffee cup to his mouth.

Timing is everything. I waited until he was mid-sip before I added, "I want to send something like either a small tree in a planter, or maybe a nice vine to your boss."

The coffee even came out his nose.

I returned to my room an hour later, after a trip to the florist (the biggest, bushiest Swedish ivy they had in stock), a stop at the front desk to check my messages, order a sandwich from room service, and terrorize Mr. Fromage.

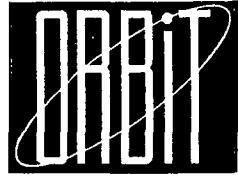
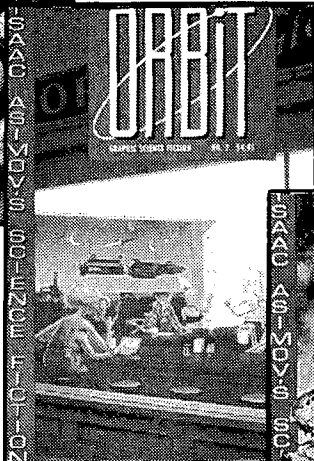
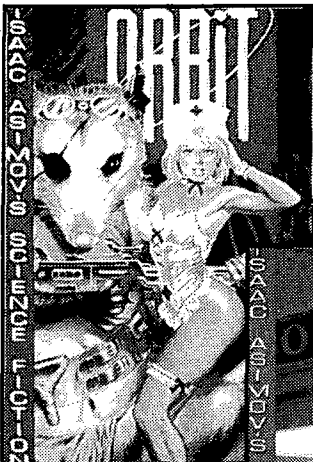
I now knew quite a bit more about the guard, a retired state trooper named Dave Spetrap, and had gleaned a few other useful tidbits of information.

When I asked him about Dr. Plantz, Spetrap expressed something akin to a grudging admiration for the man. Said Plantz was real smart, graduating at the top of his class at Cornell, but still was a regular guy, even helping him out with the *New York Times* Sunday Crossword sometimes. The main thing Spetrap had against the man was his politics. Said he was a "lefty," if I knew what he meant. A democrat at best, or maybe worse. Always writing letters to the *Gnatswarm Globe*. Always going off to Portland or Boise to take part in some damn protest march. He had all them "lefty" bumper stickers on his Volvo: Amnesty International, Nature Conservancy, Greenpeace, and the like.

My next step was to locate Plantz. So I plugged in my faithful laptop, hooked the modem to my room's phone line, and dialed up *Mysterious Ways Magazine*.

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You never will. MWM exists only inside some Pentagon surplus mainframes, in a back room of UPIGS' offices.

Because of UPIGS' black sheep relationship to the regular law enforcement agencies, we've had to develop our own special sources of information to offset the low priority our requests for data often get. *Mysterious Ways Magazine* is our equalizer.

I modestly admit that the idea was mine. Its inspiration came when, a few years ago, six days after checking into Muhammed's Exxxstatic Paradise, a no-tell motel in Beirut Lebanon, I found junk mail *in my name* in my message box.

I realized that I had been touched by a force even more omniscient than God and more persistent than herpes; namely the mailing list companies who see to it that every American, no matter who they are or where they hide, gets their full measure of junk mail.

Tapping into that relentless force has made it impossible for anyone to hide from UPIGS. We not only know where Jimmy Hoffa is, but also how often he orders from Michael Salem's, and that he's quite partial to red satin teddies.

After giving my password and Dr. Plantz's name, I instructed the search program to concentrate on alternative, ecological, and scientific causes, magazines and mail order catalogs.

I knew the search would take a few minutes so I opened up Plantz's file and studied his picture. The photo I'd been

given showed a sumo-sized, earnest-looking middle-aged man in a white lab coat. He had a high forehead, long, receding red hair, a bushy red beard, and faraway green eyes behind thick horn-rims. Picture a nerdy Irish Santa gone to seed.

There was a knock at the door. It was a skinny, slightly out of breath waiter with a long ponytail and a scraggly mustache. I glanced at my watch, and sure enough, it had taken less than five minutes for my peanut butter and banana sandwich to arrive. It looked like Mr. Fromage wouldn't get fed to the FBI as a Libyan terrorist after all. I signed the check, took the tray. I don't know what the waiter had heard about me, but he didn't seem inclined to wait around for a tip. The computer beeped to signal that it was ready just as I closed the door.

I carried my sandwich over to the computer, taking a bite as I sat down before the screen and hoping that *MWM* wouldn't let me down.

It hadn't. According to the computer, Plantz subscribed to over two dozen magazines and belonged to half that many causes. Most of his junk mail was still being sent to his old address at the Gnatswarm Post Office—a place I hadn't bothered to check, figuring that if Plantz had left a forwarding address Stump would have gotten it and used his own resources to get him back.

But two of the catalogs and three of the causes had begun sending mail to a Post Office box in a place called—brace yourself—Kilmers Corners.

I took another bite of my sandwich. Crunchy peanut butter. Nature's second most perfect food.

Kilmer's Corners. What a coincidence.

It sounded like a nice place to visit. It was time to rent a car and do a little sight-seeing. Maybe collect some souvenirs.

I soon learned that Gnatswarm had as many Hertz/Avis type car rental agencies as Light Opera Touring Companies—although it did have a Gilbert & Sullivan Used Appliances.

That kibble of information came my way because the store was right next door to Scotty's Gas, Garage, and Creampuff Car Sales.

There was a motley assortment of aged cars and trucks illustrating various states of dentedness, disrepair, and decay parked in the raggedy-pennanted lot. After some spirited haggling with Scotty himself, a grinning, snaggle-toothed young entrepreneur with a skull earring and a faded green punk haircut, I drove away at the wheel of a rust and primer red 1967 Dodge four-wheel drive truck with fake fur seat covers, no tailgate, very little in the way of brakes, and a scarred railroad tie for a front bumper.

Scotty had given me directions, but I made him throw in a map because he also told me the truck had only 40,000 miles on it. I'm sure it did. When Nixon was president. I headed north out of town, rattling along something called the Strunk Road; two lanes of patched, potholed asphalt winding its way slowly higher and higher into the sprawling foothills of what Scotty told me was called Mount Molehill.

Since my rent-a-wreck had an unnerving tendency to wander danger-

ously all over the road at speeds over 40 mph, I had lots of time to watch the scenery. There were a lot of rocks. Even more trees. Sometimes fields and small farms. Junk cars were a popular lawn ornament. Shrines made from upended bathtubs were also popular, perhaps because of a strong local belief in the link between cleanliness and godliness.

After my first brush with a logging truck—a monster semi truck/flatbed trailer combination loaded to the max with logs that made telephone poles look like matchsticks, and apparently legally bound to maintain a minimum speed of 70 mph and always pass on a double line as you went into a blind hairpin turn—I divided my attention between the scenery and the rearview mirror.

It was during those times when I'd look back to see if there was a barn-sized chrome grille four inches off my back bumper that I began to get the idea that I was being followed. There was a car quite a ways behind me that never got any closer, even though I was setting the blazing pace of an arthritic Galapagos turtle in my Scotty Creampuff.

I went over a river, white and wild with spring runoff. Beyond it the trees grew so close to the road that their branches met above me. It was like driving through a living tunnel.

Right after that the road took a sharp turn. On the right-hand shoulder stood a sign proudly proclaiming that I was entering an area managed by Stump Forest Products. I pointed the truck into the turn, glancing up into the mirror. My shadow was still back there. That was beginning to annoy me.

At the other end of the turn the forest

vanished. I had entered some sort of dale or dell or dingle; a half-mile wide bowl surrounded by naked rock cliffs.

Actually the D word that fit it best was Disaster area. It looked like a bomb had gone off. All that was left of the forest were thousands and thousands of stumps. The ground around these splintery brown tombstones was crisscrossed by a maze of deep muddy tracks and piles of debris. I couldn't see where one living thing over two feet tall had been left standing. Off on my left a wide mudhole was inhabited by a herd of dinosaurian logging machines that looked big enough to eat whole trees and shit toothpicks, clustered quietly together as if sleeping off their megatree meal.

A pickup truck was pulled off the road a way ahead of me. When I got closer I saw the faded SFP logo on the doors. Two men were working in the wasteland beyond it. I slowed down to take a better look. Both men wore bib overalls and appeared to be in their sixties. The tall skinny one leaned on a shovel. The short fat one stood by a wheelbarrow laden with a dozen drooping, dispirited one-foot seedlings.

Both men waved as I chugged by. I waved back, then checked my tail. Still there. I stepped on the gas. Valves rattling in protest, my creampuff slowly accelerated to a death-defying thirty.

I knew I couldn't outrun whoever was back there unless their car was powered by gerbils. But there was a big blind curve in front of me, and according to the sign, a side road just after.

Once into the curve I slowed, and was just barely rolling when I came abreast of the side road. I watched the mirror. When my shadow appeared I

signaled for the turn, cranked the wheel around, and floored it. A hundred feet down the wooded side road I drove into the ditch, grabbed my purse, and sprinted for cover.

My pursuer stopped thirty feet short of where creampuff was nosed into the ditch as if sniffing for roadkills. The car was an old green Plymouth station wagon with whip antennas. I wasn't exactly surprised to see the Stump logo on the doors.

After a minute this human side of beef got out. A big guy, at least six and a half feet and over 250 pounds. No neck and not much forehead. He stared at the old truck, his Cro-Magnon brow furrowed in concentration. Judging by the expression on his suety face, thinking made his head hurt.

Beefcake finally headed for the truck, reaching into his windbreaker and pulling out a gun as he went to see if I needed any roadside assistance. When he was almost to it I climbed out of the opposite ditch and scuttled back across the road.

I wasn't in the truck, of course. Once he figured that out, he lumbered back to his car and stood behind the open driver's side door, still watching the truck. He shoved his gun into his belt and started to reach for the microphone of the two way radio mounted under the dash.

That's when I popped up like a jill in the box on the other side of the station wagon. "Looking for me?" I asked brightly.

His head snapped around and he stared at me. Stupidly.

I Maced him square in the face.

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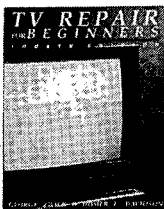
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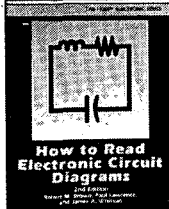
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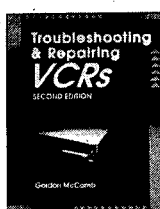
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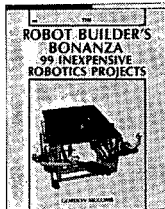
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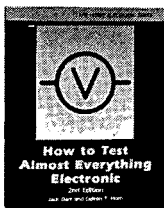
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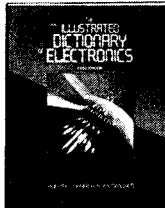
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ANA 492

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He squalled with pain, slapping his hands across his eyes and staggering backwards a couple of steps before he fell.

I hotfooted it around the car and took his gun away from him, noticing the crude prison tattoos on the backs of his hands. *Mom*. Misspelled.

"Big boys don't cry," I reminded him as I dropped his gun into my purse. "Even when some mean girl takes their toys away."

I didn't have to consult my crimebuster's handbook to figure out that Stump had him following me, hopefully to Plantz's doorstep. The question was, what to do with him? I'd put a kibosh on his bird-dogging for quite a while, but I didn't want him to even be able to say for certain that I went *thataway*.

Who would have thought you could find a heavy metal station on the radio high in the Oregon mountains?

When I backed my truck out of the ditch and onto the road it was to the muffled, melodic strains of *Raw Meat and Roses*, as performed by the Apex Lobotomy Company.

I hoped Bubba—I had decided to call him that—liked the music. He was getting an earful. I had given him one more tiny perfume-counter-type spritz of Mace, used the two way radio's microphone cord to tie his hands behind his back, stuffed him into the front seat face-down, rolled up the windows, cranked the radio up full blast, and slashed his tires. I helped myself to the CB's mike as a memento of our little blind date.

Before long I was back on my merry way to Kilmer's Corners.

Kilmer's Corners was a wide bald spot on a heavily wooded section of the Strunk Road, center of a cat's cradle of smaller side roads leading off from it. Judging from the signs I saw along the road and in town, tourism seemed to be its biggest industry.

The village post office was also its general store and gas station. The business district was rounded out by Wong's Diner, Tiny's Hardware and Feeds, Big Ed's Bait, and the Treehouse Bar & Grill (both closed for the season), and Beulah's Beauty Parlor and Video Rental. The rest of the town consisted of an abandoned looking Grange Hall and maybe thirty houses and trailers. The only thing missing was a dog sleeping in the middle of the road.

I parked and went into the post office/store, the bell over the door jingling as I entered. Inside it looked like the kind of place where Norman Rockwell might have gone grocery shopping, though if he had painted it he probably would have left out the neon beer signs and the board display of individual condoms.

Behind the counter was a skinny, birdlike, blue-haired older woman dressed in jeans and a flannel shirt. She watched me come toward her over her half-glasses, giving me that long speculative look people from an isolated area give outsiders. Even though I wasn't wearing L. L. Bean clothes with the tags still on, I knew there was no point in trying to pass for a local. I would have bet a hundred bucks she knew every birth and death for fifty miles around for the past sixty years.

I passed by a bank of brass-faced mail boxes. This was the next step in finding

Plantz, but I doubted my badge would impress her or anyone else in town very much. Telling anybody that I had been sent by some agency in Washington would probably get me the same reception as saying I was from Mars, and wondered where I could get a nice order of Kentucky Fried Baby to go.

"Hi," I said as I went up to the counter. "Can I have a pack of Luckies?" When in doubt buy cigarettes.

She got a pack from the shelf behind her. "There you go," she said as she laid them on the counter. "That'll be \$2.40."

I started rooting through my pocket for some money. "I heard there were redwoods growing around here somewhere," I said conversationally. That seemed like a safely oblique approach. They seemed to be at the, ah, root of the matter. Besides, there was a rack of postcards on the counter and one of them showed a blurry picture of what might have been a tree. It was captioned *The Kilmer Redwoods*. Talk about your clues!

She looked me over like I had asked to borrow money. "You a lumberjill?"

I bit back a smart remark. "No," I said, "I'm a photographer."

"Isn't that nice?" She rang up my purchases on a very modern computerized cash register and handed over my change. I didn't have to be Sherlock Holmes to see that she wasn't buying my story for a minute. I doubted she'd even rent it on video.

The phone on the wall over to one side of the cigarette rack rang. She took a sideways step and picked it up without taking her eyes off me.

"Call me back later," is all she said.

She hung up the phone and crossed her arms. "Anything else you want here?"

We stared at each other. She had known I was coming. I knew she knew. She knew I knew. I gave her a knowing grin because it seemed like the thing to do. She grinned back at me.

"How's the food next door?" I asked.

"Tolerable."

"Think it's gonna rain?"

"Might." A shrug. "Might not."

I saluted her and headed for the door.

"Thanks for all your help."

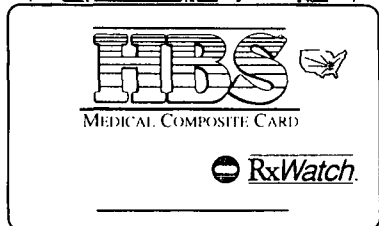
"Drive carefully, Missy. It's a long road back to Gnatswarm."

I decided to give Wong's Diner a shot anyway. I hated to admit I'd hit a dead end. Besides, it was almost three in the afternoon, I was still on dietary liberty, and the place smelled heavenly.

Ever seen those old westerns where the stranger walks through the swinging door into the saloon, causing all talk and activity to stop?

That's what happened when I went into Wong's. Every set of eyes rolled my way. Nobody stopped playing poker to stare at me over the top of their cards as I paused a moment just inside the door, but I did see a lot of poker faces. As I sauntered up to the counter I almost wished I had spurs on my sneakers.

A middle-aged Japanese man in cook's whites was working at the grill. He glanced my way, his round face inscrutable. Working with him behind the counter was a stunningly handsome Amerind woman with long glossy black hair and cheekbones you could kill for. She came over when I took a stool at the counter, her face carefully neutral.



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"May I help you?" As I doubted she'd give me a cheeseburger with the location to Plantz's hideout on the side, I asked for coffee and a menu. She pulled a menu from the rack and put it in front of me, then went to get my coffee. I could feel myself being looked over pretty good, so I turned around to look back. It seemed only fair.

Wong's Diner consisted of a ten-stool counter with only me at it, six booths and six tables. The decor was an odd mix of Diner Gothic, Oriental, and Rustic. The booth closest to me and the door was occupied by five stubble-cheeked old men in raggedy coats and an assortment of heavy equipment and seed company hats. They were holding a grumbling conference and occasionally shooting dark looks in my direction. Two booths beyond them were a young couple desperately trying to hush their little girl, who kept asking *Who's the big lady, mommy?*

The far booth held two youngish Indian men dressed in worn work clothes, one tall and rangy, the other short and blocky. The short one had long black hair that hung to his shoulders, the tall one a punkish cut and braided pigtail. Both watched me with a cool, self-contained dispassion that was more than a little disconcerting.

Only one table was occupied. Sitting at it was a big, broad-shouldered older man dressed in a faded black cotton jumpsuit. He had a ruddy, weather-beaten face, clear blue eyes, curly nicotine-colored hair, and a pleased grin that showed off his straight white teeth. He winked at me as if we shared some sort of joke.

I turned back to my menu, quickly

deciding on a couple of egg rolls. The waitress brought my coffee. I ordered, said thanks, picked up my coffee and moseyed over to that one occupied table. The man at it watched me sit down, an amused twinkle in his eyes.

I gave him my most winning smile and offered my hand. "Levi Stump the Second, I presume," I said.

He took it. His grasp was warm and firm. "Call me Levi. I'm pleased to meet you, Ms. Nation."

It hadn't been that hard to figure out who he was. There was a certain amount of family resemblance between him and his son. The younger Stump's face was like a blurry bad fax of his father's. Then there was the name *Levi* stitched in red thread over the chest pocket of his jumpsuit. It is picking up on such subtle clues that makes a good investigator.

"Call me Bertha," I said. "So you know who I am."

"Yes I do," Levi answered mildly. "What I don't know are your intentions."

"Oh, they're honorable," I assured him.

"Is that so? What if I told you I'm single, and although I no longer control the company, I'm still quite rich?"

I gave him a long appraising look. "Rich?"

He nodded. "Well?"

"Give me a minute," I told him, "I'm thinking. . . ."

Levi threw his head back and laughed. It was an easy, hearty, infectious laugh. The sound of it made the level of tension in the diner subside.

Still chuckling he said, "I heard you

were a pistol."

"Did you? Did your son call to tell you I gave him a hard time?"

Levi's smile faded. "My son." He sighed, his big shoulders slumping. The sparkle left his eyes and he no longer looked straight at me. "Yes, I suppose we should talk about him. I heard you took a dislike to him."

"Hey," I said, "I sent him posies, didn't I?"

That brought some of his smile back, and that made me feel absurdly good. I was going to have to watch myself around this guy. I had a feeling he could charm the dress off the Statue of Liberty if he put his mind to it.

"So I heard," he said. "That's part of the reason I decided to meet you. Now I have." He settled back in his chair, just looking at me. It was fairly obvious that he was trying to decide how much he should trust me and what he should tell me. I was willing to bet he was a pretty sharp judge of character. I tried to look trustworthy anyway.

After a few moments he leaned back toward me. "Tell you what. You promise you'll take the nickel tour with me and I'll answer your questions. Of course, there are a couple I won't answer. You probably already know which ones."

"Like where Dr. Plantz is hiding."

An amused nod. "That's one."

"OK, it's a deal." I thought for a minute. "I want to know how Plantz did his little instant jungle trick, but that can come later. Does your son have any claim on that how?"

"Nope. Forry—Dr. Plantz—and I have been partners in a small corporation called Green and Associates for

several years now. He supplies the brains. I supply the money and handle the business end. We have a small but very well-equipped lab. Sorry I can't tell you where. All the work on the process was done there, and every step of the research and development has been carefully documented."

"OK, that clears up the charge of industrial theft." The Indian woman appeared at my elbow. She put my egg rolls in front of me, along with a pot of Chinese mustard and a small bowl of homemade plum sauce. Then she topped off both our coffee cups and left us to our talk.

I cut one roll open. The steam that rolled out was pure olfactory foreplay. I had to swallow a flood of saliva to ask, "How did you hook up with Plantz?"

"I hired him, back when I was still in control of the company. I had some ideas and I was looking for someone to help me get them working. Well, he had some bigger ideas, and I ended up wanting to help him see them come true."

He paused to take a sip of his coffee. "See, part of the reason I can be pretty sure Sonny can't lay any valid claim to his process is because Forry's contract was with me, personally. As far as the company was concerned, Forry was just an independent consultant on retainer to me. When Sonny aced me out, a new contract had to be made. He only kept Forry 'cause it looked good. I know what's in his contract with Sonny 'cause I went over it clause by clause before he signed it."

I tried to chew faster so I could ask another question, but it seemed almost sacrilegious. Levi grinned at me.

"Great egg rolls, huh? You eat. Let me tell you a little story."

That was fine with me. These crispy-skinned brown treasure chests were absolutely positively precisely perfect. My taste buds were having a religious experience.

Levi took another sip of coffee and leaned back in his chair. "I grew up in the business. I guess you could say that my dad was a robber baron. He had a whole lot of drive, maybe even vision, but not a helluva lot of scruples. When he died I became head of his empire overnight.

"I was twenty. I was a bookworm college boy, and worse yet, my heroes were folks like Audubon and Muir and old Justice Douglas. Where my pa would look at a tree and see so many board feet of lumber and so many dollars in his pocket, I'd see a home for birds and wildlife. Erosion control. Something that had lived a long time before me, and would live on long after if I left it to hell alone. This was back in the days before deforestation or Gaia or the greenhouse effect. I just had this gut feeling that if you didn't treat nature gentle and careful you could cause troubles that would last a whole lot longer than any money you made doing things quick and dirty."

He toyed with his cup. "There's nothing wrong with lumbering if it's done right. You can cut a forest out, do it good instead of harm, and still turn a profit. You don't have to clear cut—"

"That's like what I saw on the road up here?" I asked. I was between mouthfuls, and I was supposed to be investigating.

Levi sighed. "Yeah, that's my son's

idea of responsible forest management. Breaks my heart every time I drive by and see how he wrecked that place, and that's only one ugly little piece of his handiwork."

"I saw two guys planting trees."

His upper lip curled in disgust. "When I ran the company my reforestation crew was over sixty people, and—" He shook his head. "I'd better not get started."

I was polishing off the last succulent crumbs of my egg rolls and considered ordering at least two more.

Levi stood up. "Come on, time for the nickel tour."

"OK." It was probably for the best. Those first two were no doubt already migrating toward my thighs.

"We're being followed." We were in Levi's dusty old Bronco, bucking and bouncing along a single lane graveled track.

Levi looked in the mirror. "That's just Ralph and George, from back at the diner." He glanced at his watch, set the CB to channel three. "It's OK guys," he said into the mike. "The lady's being responsible." I made a mental note. The channel they used was the same as the hour. Very clever. They were really working hard to protect Plantz.

There was no reply, but the car behind us stopped and began turning around. Levi switched off the CB. "They're just being cautious. Their people have a pretty big stake in all this."

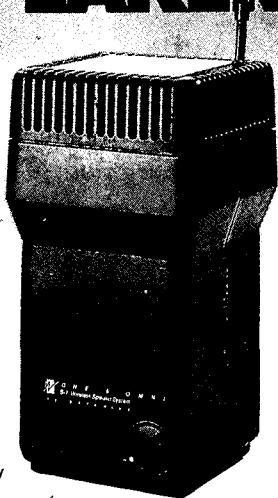
"What stake is that?"

"Parts of the Kilmer Tract are sacred to them."

Curiouser and curiouser. "By the

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way, someone tried to follow me to Kilmer's Corners."

He thumped the wheel. "Damn! Who?"

I described Bubba.

Levi looked decidedly unhappy. "That's Billy Morgan, my son's 'driver.' He's a real sweetheart. An ex-con, and mean as a snake. How did you shake him?"

I told him about my little run-in with Bubba. He might be Billy to his mama, but he'd always be Bubba to me.

Levi laughed so hard he almost drove off the road. "Boy oh boy," he said once he got control of himself, "I sure am glad you're on our side."

I stared at him. "What makes you think I am?"

"Even if you aren't now, you will be once you have all the facts. I just know." His self-confident smile slipped. "I've only misjudged one person in my adult life. That was my son." He sank lower in the seat, and drove faster. I tightened my seat belt and lit a cigarette. We were going so fast that the mirrors were clipping leaves around the turns.

Levi started to talk, and I knew by the sound of his voice that he was talking to himself as much as to me, and that this was no new monologue. "I should have fought him right at the very beginning, but I didn't. I couldn't believe that he could be so greedy and ruthless. That he could do that to me. I made excuses. Since then . . . it's almost like he's trying to provoke me with the rotten things he's done. Things that should've made me find my backbone and stand up and fight him head on." His eyes were far-away and sad as he looked back on all

his should-a-dones. "But I haven't."

"Where are you taking me?" I wasn't really trying to change the subject. Really.

He shook himself out of his funk, coming up with the thin crust of a smile. "To see where the gods live."

Talk about your nickel tour!

We left his Bronco in a sort of natural parking lot: a wide flat expanse of bare red rock surrounded by trees. We started up a narrow footpath, the slope spotted with sparse trees and occasionally heavy underbrush. Birds flitted from tree to tree all around us. A flock of geese honked at us as they passed overhead. The path was obviously leading us into the depths of the forest. There were no neon signs or portents: *THIS WAY TO THE GODS*.

Levi pointed to a tree. "That's an ash. See how tall it is? How big around the trunk is? I'd guess that it's probably twenty to thirty years old. Now look at that one over there."

I looked where he pointed. The other tree was shaped completely different but roughly the same size. "That's an oak, and it's probably closer to fifty years old."

I nodded in understanding. "The point being that they grow at different rates."

"That's it. Many factors determine how well a tree grows, but its optimum rate—its clock—is genetically predetermined. The first time Forry and I talked he told me he might be on the trail of a way to reset that clock."

"You decided to help him find it."

"I sure did."

"Why?" I already had an inkling,

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but I wanted him to tell me. The more I knew about the situation, the better, and every time Levi talked I learned a little more about him in the bargain. Plantz might be the mad scientist behind the Stump Tower Event, but I had a feeling my escort was pulling a lot more strings than he let on. Besides that, I know when I've been dealt a wild card. Levi had wild card written all over him. Maybe it takes one, etc. . . .

"OK, but you've bought yourself a sermon. See, my pa had the attitude that he could cut all he wanted and not worry about it running out. He would've laughed in your face if you had told him he should cut selectively and replant. I know, because he laughed in mine. There was always more land and more trees. That wasn't true even then, and it becomes less true every day.

"Now take someone like my son. He sees all the good tracts being used up fast, so what does he do? He makes sure he gets his share. He grabs what he can, and cuts what he's got as fast and dirty as he can to help finance prying loose a few more chunks of public land so he'll have something to cut after that's gone. He sees the trees disappearing, but he'll replant only enough to keep the government and the ecofreaks off his back, and not one stick more.

"It all comes down to attitude and to money. To excuses. America needs wood products, and the cheaper the better. Clear-cutting existing stands brings the maximum immediate profit. Replanting—even monocultural replanting, which is better than nothing, but not by much—costs money up front, and the payback is too far down the line to mean anything to this or even next year's bot-

tom line."

He looked my way, his eyes glowing. "But what if timber could be farmed, like you grow corn or soybeans—or even Christmas trees? Quickly. Cheaply. Efficiently. Even if he and some of the other timber thugs were still too stupid and short-sighted to see the advantages in that, the fact that it was possible would make it a helluva lot easier to force them to leave the old, irreplaceable growths alone."

"You'd do that by speeding up the farmed trees' clocks."

Levi grinned at me. "That's it in a nutshell."

"Plantz used the process to grow an instant jungle around Stump Tower almost overnight." I stared at him. "You can really grow a forest that fast?" The concept was mind boggling. It was the thin sharp wedge-edge of a revolution. And if it worked for food as well as forests. . . .

"It's not quite that easy, Bertha. That was an extreme case, helped along by three days of rain, fairly rich earth under the plaza, and a tanker full of fertilizer. See, Forry uses something like a virus to alter the genetic structure of the plant at the seed or sprout stage. There he set the clock running as fast as possible. But it was like plugging a digital watch into house current. It burned them out before their time. In another three or four days all of the stuff growing there will be dead of old age and starvation. They only lasted this long because of all the rain we had."

I was getting the picture. Time to tweak him. "You helped plant that mess. You're one of the terrorists."

"Terrorists?" He chuckled. "Well,

let's put that aside for a time. I did help. I figured it was my right to, ah, spruce up the place a bit. See, I still own a chunk of the company, and that includes the Tower. That's where the money—quite a lot of it, by the way—that funded Forry's work came from."

Now we were climbing a steep tree- and shrub-covered slope. The vegetation was growing denser. "Why did you do this now?" I asked. "Why not last year, or next?"

Levi scratched his head. "This is where it gets real interesting. The first factor was Sonny finally getting his greedy little hands on the Kilmer Tract. Forry and I helped the Indians and other folks that live around here fight it every way we could. But Sonny got it rolling back when Ronnie was in office. In those days, if you had the right money and the right connections just about anything was up for grabs."

He grimaced. "Not that things are much better now. Anyway, he kept it rolling with cash and leverage and lawyers, and about a month ago the deal was finally done."

"Forry was still working on his tree clock process, but he'd stalled. Then this all happened. Forry took it hard. He was about to say to hell with everything. Kept saying we might as well quit banging our heads against the wall and let them turn America into nothing but asphalt and concrete and condos and burger joints and toxic waste dumps, from oil-slicked sea to garbage and shit-flooded sea."

We reached the top of the slope. The trees and underbrush grew so thick around the winding path I couldn't see much more than fifteen feet in any di-

rection.

"When he calmed down he decided to come up here to sit and think. The Indians say that the gods live up here. Forry always used to laugh about that. Said he was a scientist and didn't put much stock in gods. But that day he told me that if there were any such things, he sure could use their help."

He stopped. "Give me your hand."

I took the hand; he offered me. He gave me this strange smile, then started through the greenery again, towing me along after him. If we were on a path I couldn't see it.

All of a sudden we came out onto clear shaded ground. There was a cliff face in front of me, jumbled rocks piled up at its base. There was something odd about it. . . .

"He came up here to think and to remind himself what he had been fighting for. To this day he swears that the gods spoke to him. This is the exact spot where he heard them."

I realized that the wall had bark on it. Rough dark bark split by fissures as deep as my hand. I blinked my eyes, my breath catching in my throat.

I was standing at the foot of a tree. The wall was the trunk. What I thought were rocks were gnarled knees of wood.

"Big Tree, these are called."

Big Tree. The trunk had to be almost thirty feet across. I tilted my head back, looking up and up and up a highway of wood, a mountain of wood, a river of wood flowing straight up.

"Those lowest branches are maybe a hundred feet up."

I think I shall never see. . . .

"She's maybe 230 feet tall, all told."

I had to look down, it was making me dizzy.

"This beauty was already several hundred years old when Jesus was a pup."

I started to walk around it. I couldn't help myself. It was just too big to be real, and maybe if I got behind it I'd find George Lucas and he'd tell me how he'd pulled the trick off. Levi followed me. He spoke softly, reverently.

"These trees are kind of an anomaly. It's almost like they were planted here. There's exactly a hundred of them, all about the same age and size."

I was still walking. "The bark is maybe two feet thick. Fire can't hurt it. Two thousand years of wind haven't been able to blow it down. It's roots cover several acres."

Roots. I tried to imagine the grip it had on the earth, on life, on time. Acres. Millenia. *Poems are made by fools like me.* . . .

"Old Forry came up here and sat with his back against this very trunk. He says the gods spoke to him. Not in words, but in knowing. All of a sudden a light dawned, mystery turning to understanding in an instant, just like Newton under his apple tree. He saw it was easy and simple and beautiful. He had the key to wind the clock that sets a tree's time, and he knew that he'd been given that knowledge so he could save these trees."

I was still walking around the tree. Even if it was only (only!) twenty-five feet in diameter, that still meant it was somewhere near eighty feet around.

"I wasn't about to argue with him, and when I come up here myself I wonder. . . ."

There were egg-sized cones scattered on the springy ground. I picked one up, held it in my hand and tried to make the mental leap between it and the living skyscraper beside me. Above me. Under me. I fell flat on my mental face.

"Sonny can only harvest a few of these beauties. But the way I see it, cutting even one of them to make flower boxes and picnic tables and saunas for rich yuppies would be like tearing down a Greek temple so you could grind it up and use it for road fill."

I shook my head, trying to clear it. We have massive old oaks in Minnesota, centuries old, with trunks almost ten feet across. I've seen baobabs and banyans. But this was something else. I lacked the words to say what, and I was half afraid a voice might start whispering them in my ear. . . .

Levi put his hand on my arm. I looked at him and saw how badly he wanted me to understand what he was telling me.

"What my son has done with the company makes me sick. He doesn't give a damn about the people who work for him. He doesn't give a damn if his mills pollute. He's reduced god knows how many square miles of living forest to eroding wasteland. Now this."

"Folks around here feel strongly about this place and these trees. He sends people up here to start cutting there's going to be a war. But even if it weren't for that, I couldn't stand by and watch him cut even one of these trees down just so he can buy another friging BMW. I guess that's the straw that broke this camel's back."

His face was dead serious and his voice was a tight hard rasp. "Do I feel

like a terrorist doing anything I possibly can to stop him?" He shook his head. "Not one goddamned bit."

Levi did most of the talking on the walk back to his Bronco and the ride back to Kilmers Corners.

He wasn't taking any chances on my being converted to his cause. He talked facts and figures, painting a grim picture. He talked about timber harvest outpacing growth. About national forests being turned into plywood and cardboard takeout boxes, about rivers choked to death by the eroding soil from clear-cut lands. About lumberjacks and other workers who were forced to side with the rape of land because they had families to feed. About vast multinational corporations whose practices were as bad or worse than his son's.

Then he talked about how Plantz knew all the good that could come from his discovery once it was revealed. Yet he wanted to keep it a secret. Because he believed that the gods had chosen him to be some sort of sacred warrior, and had been given his knowledge to be used first as a weapon. Some of the Indians and young people in the area believed it too, and they were ready to join him in battle.

Levi said he didn't know if that was crazy or not. In the end he and Plantz had struck a deal. They would hold off revealing Plantz's discovery for six months, which would give him and a few of his followers time to carry out guerilla actions against a few other enemies of the environment. To go wherever trees were being massacred and give them a chance to fight back.

Levi told me all this hoping it would

convince me to quit looking for Plantz. To tell Washington that the Stump Tower Event was just some sort of prank, and Levi's son some sort of crank. To hush the whole thing up so the Mad Doctor and his Merry Band would have time to do a little guerilla gardening, just like at the Stump Tower. It needed doing. No one would get hurt.

It all sounded very good. He was very earnest, very persuasive: I wanted to believe him. The whole time he had talked I sat there turning that Big Tree cone over and over in my hands. It wanted me to believe him.

Part of a line from Dylan Thomas came to me, a line about "the force that through the green fuse drives the flower." A green fuse had been lit. The question was, what was I going to do about it?

I threw the cone out the window.

"Well, Levi," I said, lighting a cigarette and eyeing him through the smoke. "You've sandbagged me pretty good, haven't you?"

He looked at me askance, smiling faintly. "Have I?"

"You've got some good moves for an old guy," I admitted. "So what's next? Are you going to offer me money? Your body?"

"Bribery's not my style," he said with a crooked grin.

I snorted. "You're a charmer, I'll give you that. You'd put on high heels and fishnet stockings, and vow to be my love slave if you thought it would let you get your way."

He chuckled. "What color high heels?"

"Shut up and drive," I said sourly. "I need to think."

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"I look good in red."

The imagination can be a terrible thing sometimes.

"Oh shit!"

I saw the same thing Levi did at the same time, and those were my sentiments exactly. He stomped his foot on the gas pedal, both hands tight on the wheel, staring ahead and cursing.

There was an old blue sedan parked crosswise on Kilmers Corners main drag. Beyond it was a shiny black four wheel drive. I recognized two, four, five faces right off. I saw guns.

"Stop behind that car," I told Levi, already emptying my purse on the seat between us and filling my pockets. He spared one glance at the items going into the big cargo pockets of my pants, his eyes widening, then spun the wheel and jammed on the brakes, bringing us to a skidding halt behind the sedan.

"Stay here," I said as I jumped out of his truck. I heard his door open but ignored it. No time.

I walked around the car and past the two stony-faced Indian men from the diner. Each had a shotgun pointed at the men clustered around the front of the black truck.

Four men were in their field of fire. One was my old buddy Bubba, his eyes still red and swollen from our previous meeting. He glared at me with murderous hatred as I came closer, lips peeling back from his yellow teeth.

I recognized Dr. Forrest Plantz from his picture. His glasses were askew. The cuts and bruises on his cheeks and forehead told me he'd put up a fight. There was a gag in his mouth and his hands were bound behind him. Bubba

had an arm cinched around his neck in a chokehold, and a gun pressed up against his temple. I had to wonder how they had found him, but at that moment it was a moot point.

At Bubba's elbow was Levi Stump III, his little pink face tight and hostile. And afraid. He was sweating buckets. I was willing to bet he was even more afraid than Plantz.

I only glanced at those three. The new face in the equation drew my attention like a magnet. He was a tall, raw-boned man with that loose, easy, don't give a damn look of a seasoned combat veteran. He wore a white cowboy hat, tight jeans, and a sheepskin vest over a blood red western-cut shirt. He stood beside Stump, and gave me an amused smile as I came closer. His eyes were hidden by mirrored sunglasses, but I was willing to bet they were as cold as an IRS auditor's heart.

"Hold it right there, little lady," he drawled when I was still ten feet away. Texas accent.

I smiled back. "What's up, Sundance? Showdown? Hoedown?"

He grinned. "We's just taking this here terrorist into custody." His gaze flicked past me to the shotgun-toting Indians behind me and back again. "Them boys is tryin' to stop us. I told them they best put them guns down and step aside, but they don't lissen so good."

"I see. You said you were taking him into custody. Am I to infer that you're a brother law officer?"

"He's my head of security, and a full deputy in the sheriff's department." Levi's son put in, trying to sound commanding but overshooting the mark by

at least an octave. He thrust out his weak chin. "Now that Plantz has been arrested I don't need you any more."

"So I should just run along and let you big strong men handle it?" I asked sweetly.

"If you don't, you getcher ass kicked," Bubba warned, staring at me over Plantz's shoulder with the dull stupid menace of a particularly dim-witted pit bull. The kind that would chew its own leg off trying to bite a flea.

"I'm sorry I made you cry," I told him. "You've probably been unhappy enough since you got out of prison, what with missing all that good lovin', snuggled into your bunk after lights out with your ankles up around your ears."

"Don't—" The rest of the deputy's warning was drowned out by the angry snarl Bubba let out as he thrust Plantz aside and launched himself at me.

Bubba should have gone to Obedience School, or at least listened. My first kick pinballed his testicles somewhere up into the vicinity of his eyeballs, judging by the way they bugged out. I felt his kneecap *give* under my second, and my third caught him in the back of the head hard enough to make it bounce off the asphalt. He showed no inclination to get back up.

I stuck my hands in my pockets and looked up at the two left to go. I was probably smiling.

"Now you shouldn't have done that," the deputy said mournfully. He'd grabbed Plantz, and held him in front of himself like a shield with one hand. In his other hand was a very nasty looking machine pistol. Pointed at me. He glanced at his erstwhile employer. "Git over here behind Plantz and cover

him."

The little pink tycoon stood there gaping at him stupidly, then sidled over, fumbling a small silver automatic out of his coat pocket. Plantz was wide enough to shield both of them. He stared at me beseechingly. I threw him a wink.

The deputy looked back at me. "Nice moves, lady. What was that? Karate?"

I shook my head. "Ballet."

He snorted. "Cute." He moved the machine pistol slightly, pointing it at my belly. "Now why don't you just take your hands out of your pockets and get 'em out where I can see 'em."

I cocked my head. "I give, why?"

"Look," he said heavily, "This has got kind of messy. We wouldn't want it to get any worse, would we? The way I see it we can play this two ways—"

"Don't tell me, let me guess!" I put in brightly. "We can do this hard, or we can do it easy. Excuse me, easy-like."

A humorless smile appeared. "You got a smart mouth on you."

"Let's not get sidetracked with flattery, Sundance. I assume the easy way is letting you and little Napoleon mosey on back to Gnatswarm with Dr. Plantz, so you can make him sign a bunch of papers that say all rights to his process belong to Stump Forest Products. After all, it has to be worth millions."

He nodded. "That's about the size of it."

"And the hard way. . . ."

A shrug. "A lot of folks get hurt. You and all these nice people—" he swung the gun in a short arc, "—first." Most of the population of Kilmers Corners had come out to watch the show-down. He could pick off about twenty

with one burst of that machine pistol. "The two shotguns them young bucks got don't count for much."

"No," I admitted, "I don't suppose they do."

"Well, maybe more'n your mouth is smart after all. So why'n't you let me see your hands, then back off outta the way."

I scuffed the ground with my toe. "The thing is Sundance, I don't think you really want to see my hands."

"Are you crazy?" he demanded.

I looked up at him and giggled. "It's been suggested."

His voice turned hard and cold as the gun in his hand. "Crazy or not, you're gettin' your tit in a wringer, you don't quit dickin' around. I wanna see them hands by the time I count three."

"Four, five," I chanted, pulling my left hand out of my pocket. "Six, seven, *eight!*" I lobbed what I had in my hand at him. "*HIT THE DECK!!*"

I saw his eyes fix on that pinless, handle-sprung grenade as it came toward him. I saw surprise and realization register in that fraction of a second before his reflexes took over. He gave Plantz a shove and flung himself off to one side.

He was fast. He hit face-down, his arms stretched out in front of him to take the impact, the machine pistol still gripped tightly. He was already coiling himself to roll around with the gun in front of him when I put a bullet through his cowboy hat, knocking it off his head. I'd always wanted to do that. It was worth the wait.

He froze. "That's good," I called as I covered the space between us. "Now let go of the gun."

Before he could decide to try something I poked my little snubnose into the hollow at the base of his skull. "Want me to change your mind?"

"It was a damned dud," Sundance said bitterly, his shoulders slumping as he released his hold on the machine pistol.

"Jeez, I thought it worked perfectly. Now slap the gun away." It went skidding across the pavement. Wong left the front door of his diner and went to stand by it, pointing the old .22 rifle he carried at Sundance.

"*N-nobody move!*" That from behind me. Very shrill.

I turned around. Plantz had managed to get to his feet and tried to run away. Stump the younger had snagged him by the back of his shirt. Now he had his little silver pistol jammed into Plantz's ribs. The two Indians had gotten to within twenty feet of them. They stood poised, shotguns lowered but ready to come up at any instant. There was no way for them to fire without hitting Plantz.

Stump shot a wild-eyed glance in my direction. "Let him up or I shoot!" I opened my mouth to answer, but never got a chance.

"*Put that gun down right this instant!*"

That command came from Levi. He strode toward his son, a sad, stern look on his face. The younger Stump pointed his gun at his father with a trembling hand. "D-don't come any closer!" he shrilled. "I'll shoot!"

Levi kept coming, slow and deliberate. "This nonsense has gone on long enough, son. You're in way over your head. Put the gun down and let Forry go."

His son's finger tightened on the trigger. So did mine. I'd backed away from Sundance so I'd have room to move if he tried something cute and took a combat stance. I had a clear shot at Stump.

Levi turned his head and gave me a look. I could read the plea in his eyes clear as print. As he turned back to his son I lowered my gun. "It's over now," he said quietly. "Give it up."

Plantz wrenched himself from Stump's grasp and stumbled away. The two braves faded around to one side to intercept him. Stump was beyond noticing, all his attention on his father.

The two generations faced each other. Levi looked stern and unafraid, but sad. So very sad. Like what was happening was all his fault, and even stopping it wouldn't make it right.

"You can't make me," his son said, his voice sounding reedy and thin. "Everybody thinks you're so great. Everybody admires you. Everybody *loves* you." He gripped the gun with both hands, pointing it at his father like an accusing finger. "Well I *hate* you! I'm stronger than you! I took the company from you. I beat you out of your precious trees." He swallowed hard and blinked against the sweat dripping into his eyes. "You couldn't stop me then. You can't stop me now."

Levi had halted about a yard away from his son. He sighed, broad shoulders slumping. Suddenly he looked very very old. "I don't know what I did wrong that made you turn out like you did, unless it was giving you everything you wanted to make up for not having a mamma. I guess it don't matter now."

He sighed again. "I'm still your father, and it's time I acted like it." He held out his hand. "Now give me the gun, son." He took a slow, resolute step forward, eyes on his son's face and not the gun.

Stump let out a choked, trapped animal sound and pulled the trigger. The gun went off with a flat crack. I flinched. Levi staggered and a grimace crossed his face, but he kept his hand out and never took his eyes off his son's face.

Horror warped Stump's face. He stared down at the smoking gun in his hands as if seeing it for the first time. "Oh Jesus," he whispered, letting it fall from his fingers. He looked up at his father, his face crumpling into that of a bewildered child.

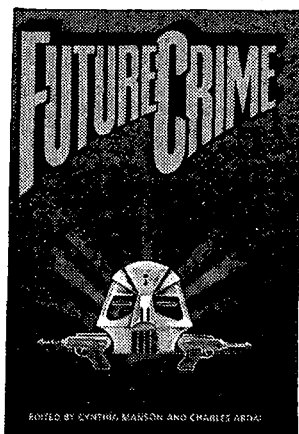
"Daddy, I—" He tottered forward a step, shaking his head from side to side as if to deny what he had done, an anguished sob tearing from his throat. "I—"

Levi put his arm around him and held him tight. "I know, son," he said soothingly. "I know." His son started to sob, hiding his face against his father's chest.

Motion drew my eye. I looked past them and saw Plantz and the shorter of the two Indians disappear into the woods at the edge of town. The tall one stopped. He looked back at me and smiled, his gaze dropping meaningfully down from my face toward my hands.

I looked down. In one hand was my gun. In the other was a rough brown cone about the size of a hen's egg. When I looked up again he was gone.

I closed my hand around the cone a moment, then shoved it into my pocket.



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Once I had finished cuffing Sundance I called to the grocery store lady. She stood on her front step, a double-barreled shotgun cradled in her arms. "Would you please call the state police, and then bring me some rope."

I glanced over at Levi. He held his crying son tightly, ignoring the blood seeping through the arm of his shirt.

"Better have them bring a paramedic too." She nodded curtly and went inside.

Levi and I watched the ambulance and police cars roll away. It was almost dark, the colors slowly leaching out of the day. A damp chill had fallen. We sat on the back of my truck, drinking hot coffee spiked with brandy courtesy of Wong's Diner. Kilmers Corners was quiet once more.

"How's your arm feel?" I asked.

"Hurts like a bastard."

"I bet. How's it feel to be back in charge of your company again?" His son had fallen completely apart. He probably wouldn't be going to jail, but he was going to be spending quite a while in an expensive private sanitarium.

I almost felt sorry for him. His father's shoes must have looked impossible to fill, and yet he had that Stump drive coiled up inside him. Unable to compete with what Levi was, he had made himself everything he was not. Punished him every way he could, maybe even tried to provoke his father into punishing him.

"Rotten." Levi muttered. "I never should have lost it." He shook his head, looking sad and beaten.

"You let him have what he wanted,"

I said, "Hoping it was what he needed."

"Maybe." He took a sip of coffee, wincing as the bandage tightened on his injured arm. "So what happens now?"

I shrugged and lit a cigarette. "Clean up the loose ends, I guess. Write my report."

"What are you going to write?"

"Depends on how my interrogations go."

He stared at me. "Who you going to interrogate?"

I slid my free hand into my pocket. "Well, as far as I can tell you're the only one involved in this mess who hasn't escaped or been arrested. So hold out your hands."

Hanging his head, he put his cup aside and did as he was told—something I like in a man. I took my hand out of my pocket and put in them a little something I'd picked up at the general store while the paramedic was bandaging his arm.

It was a pair of black fishnet stockings. His eyes widened in surprise.

"Actually," I told him, "They're my size, not yours. But we have to start somewhere. There'll be lots of time to get some for you. The interrogation could take days."

Levi looked stunned. He licked his lips. "W-what about Forry? Aren't you going to try to find him and stop him?"

"There's no point." I waved my hand at the darkening wilderness surrounding the town. "It's almost night. They have a big head start and know the territory."

"Won't you get in trouble with your agency for not trying?"

"I doubt it. After all, there's only

one of me and hundreds of miles of woods out there. I'm good, but not that good. It's my call, and I'm calling it a day. Besides, I know how to explain it to them."

"And how's that?" he asked, watching me closely.

I gave him a big grin, thinking of the big tree cone in my pocket and the green fuse that had been lit. "I'll tell them that it was obvious that I wasn't going to be able to see the Forry for the trees."

■

On Our Cover . . .



July 21, 1969, 1:54pm EDT. With an almost flameless burst of power the upper half of Eagle lurches upward, carrying Neil and Buzz to a lofty rendezvous and a trip home. Within hours of their departure, the tranquility of humanity's first lunar base is interrupted by scientists again. The Kn-dai team has been preparing for this moment ever since the first human flyby of the Earth's Moon.

Dr. Ch-hun-kha begins his study of state-of-the-art human technology by examining the ALSEP, an automatic scientific station. He rests his instrument package on the solar panel of the enormous seismic detector and gently places a relay cube onto the tip of his own seismic device. He marvels at a race which could reach another heavenly body with such clunky gear. To his right, the laser reflector was damaged during lift-off, but the benevolent Kn-dai have replaced the sensor input with their own in order to help the humans accomplish their experiment.

Rick Cook & Pete Manly

CYBERSPACED OUT: MANNERS AND MORES IN THE GLOBAL VILLAGE

When old human interactions
take place in a new medium,
it's hardly surprising that
they take new forms!

Twenty-five years ago the Canadian communications theorist, Marshall McLuhan, observed that the way we communicate greatly influences what we communicate. Or, as he put it, "the medium is the message."

McLuhan also predicted that electronic media would produce a global village, a "simultaneous happening" that would bring everyone closer together.

While it isn't quite what McLuhan envisioned, we now have an electronic global village—or rather an interconnected cluster of them, like linked hamlets making up a village. They are the computer networks where people communicate with personal computers and modems. It isn't a big village, perhaps two or three million inhabitants total, but some of the hamlets are global. You

can routinely "talk" to people from New York to New Zealand without leaving your keyboard.

Like all villages the global village has its own culture and mores. It has its own heroes and villains—and its occasional global village idiots.

In the global village the communications medium influences what we say and how we say it. Electronic conferencing has evolved not just a culture, but a mode of expression and on-line behavior as well. The medium may not be the total message, but it affects the way you say things and even to an extent what is said.

THE NATURE OF CONFERENCING

No one knows how many hamlets there are in the global village. They range from a half-dozen or so major

commercial services like BIX and CompuServe to thousands of local computer bulletin boards (BBS) run by hobbyists.

The commercial services have tens of thousands or hundreds of thousands of members around the world. In addition to the Byte Information Exchange (BIX), they include CompuServe, Prodigy and GENie. There is also a very queer duck called Usenet which is international but not commercial, and another called Opus which is kind of a BBS for BBSs.

All of them have things in common and taken together those things shape the way the global village works. Although most of these characteristics apply to all computer conferencing systems, our examples are drawn primarily from the Byte Information Exchange (BIX), a worldwide network sponsored by BYTE magazine, a major computer publication. This is mostly because we hang out on BIX.

The first characteristic is that everyone communicates by typing. Ironically, McLuhan's global village, the epitome of his idea of "hot" (emotionally involving) media, turns out to rely on the "coldest" (most rational, least emotionally involving) of methods—pure text.

The second characteristic is that conferencing is semi-real time, like leaving messages on telephone answering machines. You say what you have to say, and come back the next day or next week to read the responses.

Conferencing gives socialization 24 hours a day. Can't sleep? Log on and burn your mind out 'till dawn. So what if everybody else in a topic is snug in

bed. You can read the messages they posted hours earlier and interact with them.

On some systems, like CompuServe, messages automatically die after a day or two. On others, like BIX, messages are effectively immortal.

Another important characteristic is you always get your turn. When you are ready, you make your reply. You may get angry comments from a dozen people who disagree with you, but they cannot shut you up. You cannot be crowded out of the conversation, shouted down or kept from finishing your thought. Even if you're shy or a careful thinker you can get your two cents in.

Conferencing gives you time to get it right. How often have you thought of the perfect response minutes or hours later? In a computer conference you can go back and insert that piece of wisdom.

THE ACT OF SELF-CREATION

There is another characteristic that helps determine the way people act on conferencing systems. All you know about the other people is what they choose to say about themselves.

Bulletin boards are blind to race, sex, handicaps, age, creed, and national origin. You find yourself forming an image of some college kid based upon an exchange with another BIXen concerning politics. Surely this guy can't have had any real world experience. Then out of the blue he begins a message with "After I came home from the Korean War. . ."

Many system identifiers (names people use in logging on) are simply a first

initial concatenated with the last name such as "rcook." You have no idea if "jsmith" is John or Jane. Until jsmith says . . . "as I told my husband the other day. . . ." you will never know.

There are a fair number of handicapped people on the nets because their handicaps don't matter. One acquaintance whom I (PM) had known for seven years is profoundly hard of hearing. I found him to be a quiet, introspective gentleman of one or two word answers. When I met him on a bulletin board, however, he was verbose and erudite. He has a wicked sense of humor and a wealth of experience to share. I believe he uses the computer to satisfy a basic need to chat.

Similarly, at least one BIXen is severely handicapped with cerebral palsy and another is a quadriplegic. It must take them an hour or more to compose and post a moderately long message, but that doesn't keep them out of the conversation.

Location is invisible as well. Conferencing systems like BIX have a world-wide reach. I (RC) know people from London to New Zealand and Iceland to Baltimore, that I talk to regularly on BIX.

This can have bizarre and occasionally comic results. During a discussion of energy sources one BIXen casually mentioned that "we" get a significant fraction of our energy from geothermal sources. Several people jumped on such an obviously untrue statement—and then realized that the "we" was New Zealand, where he lives.

* * *

WAYS OF THINKING

Most of the time people do the same things in computer conferences they do elsewhere. Which is to say they ask for information, swap jokes, exchange recipes, etc. All of that works pretty much the same way whether you're doing it face to face or by computer.

But there are some kinds of communication which are strongly influenced by the medium.

Functionally, a good computer conference is like a cross between a conversation and writing letters. It has the immediacy and much of the emotional impact of a conversation, but it encourages the kind of story-telling and development of ideas you find in letters.

Because it is a "cold" medium in McLuhan's sense, conferencing emphasizes rational, fact-oriented modes of thought. Like letter writing, there is a premium on organizing your thoughts and presenting them logically. Part of this is the number of scientific and technical types conferencing systems attract, but part of it is simply that it is hard to follow a rambling, incoherent message—especially when it is split into screen-size chunks and you can't reread as easily as you can with a letter.

As a result, conferencing produces a distinct style of discussion. There is a strong element of debate in the mix. Because the people are so heterogeneous and because we know so little about each other, there is a tendency to say things on-line we would not say face to face. Someone says something, someone else disagrees, others chime in, and you're off and running.

But it tends to be honest, informative

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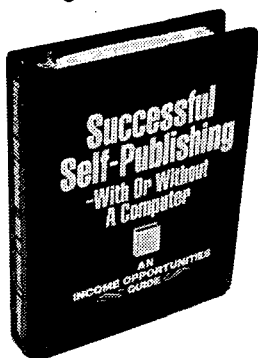
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debate. Like a letter, anything you say can be preserved for analysis. In fact, in an argument what you say is likely to be analyzed by several people and those people can take the time to go check your facts. They can respond immediately, pointing out holes in your reasoning, misstatements of fact, and so forth. Since BIX and some other systems keep messages around, they can go back and point out inconsistencies from previous messages and such.

A lot of argumentative tricks and logical fallacies that slide by in talking or letter writing simply won't work in electronic conferencing.

Since conferencing is only semi-real time, you can always go research a point: When one of us (RC) is reading a long message, he keeps a note pad by the computer to note points he wants to respond to. The other (PM) takes a more technological approach. He uses an electronic notepad program on his computer.

For especially complex arguments we sometimes go off-line, review the recent messages, do a bit of reference work in our libraries, and then log back on to answer a message. Somebody else may post a separate message commenting on the same one you answered but you will get to finish whatever you started.

However, this combination of talk and letter writing does not produce a rationalist's nirvana. In fact a lot of the time it produces very heated arguments—in spite of the “coolness” of the medium and the emphasis on logic.

Humans are at best only marginally logical animals. If you believe strongly

in banning abortion, women's rights, gun control, or even the supremacy of the Unix operating system, a disparaging remark is likely to trigger a strong response no matter how logical you are.

The combination of letter/conversation characteristics makes the situation worse. Because of the immediacy you tend to react to messages as if they were spoken. But because you are not face to face with the person, you tend to put things more strongly. The result can be a feedback mechanism that wrecks any hope for discussion.

THE RHETORIC OF CONFERENCE

To the Greeks and Romans, “rhetoric” was the art of speaking gracefully and convincingly in public. Today it means, among other things, the methods of communicating effectively in a given medium. Thus critics will speak of the “rhetoric of film.”

The rhetoric of the global village grows straight out of the nature of the medium.

For one thing, it is concise. While you can develop an argument at some length, the nature of the medium means you had better express yourself concisely.

Computer screens are hard to read and most of them can only display about half a page of text at a time. A message longer than two screens (about 500 words) tends to lose the reader. So nearly everyone holds messages down to less than two screens most of the time.

Of course, there will always be those who feel that 10-screen arguments on obscure political causes are compelling simply because they're interested.

These people are called bores. We learn to skip their messages.

There may be a new genre of writing forming here. Just as the ability to condense an entire message into Western Union format is an acquired and valuable skill, the ability to make your point in one screen is valuable in a conference.

The exception to the short message rule is Usenet, and once again this reflects the medium. Usenet is a completely distributed system that works by passing messages from computer to computer. Not all computers are connected to the net all the time and not all messages will follow the same path to a given destination. Further, because not all the nodes (computers) on the net carry all the newsgroups (conferences), some news group messages will not be passed to all members of the group.

The result is that you can't be sure that the people in the news group will see the message you are responding to. They may not see it at all or they may see it days later than your response. So you quote the significant sections of the earlier message. Of course that message is likely to be a response to another message, so it contains a quote, and so on. Usenet messages can be two or three screens deep in quotes before you get to the new message.

Computer conferencing is not only concise, it teaches us how totally dependent we are on nonverbal clues. There are none over a computer, just lines of glowing letters. You don't even get the significant pauses and silences you hear in a telephone conversation.

You can't see how your statements

are affecting the other person. You often don't know the other person's background. You can be totally unaware that you are treading on a very sensitive area until someone blows up and flames you.

Computer conferencing tends to either hide emotion completely or exaggerate it. If you do not express emotion no one knows what you are feeling. If you do express it, it tends to come across more strongly than you intend because your modes of expression are so limited.

Perhaps the most striking thing about computer conferencing is that it has developed an entire meta-language to express emotion. This usually takes the form of non-English symbols which are inserted into messages to show tone or emotional content.

For example, simple emphasis is indicated by *asterisks* or underlines before and after a word. (You can't be sure the reader's computer can handle underlining the word.) Entering a word all in capital letters is SHOUTING and it is considered rather rude.

There are also clue words such as <grin> or <just kidding> that are used to show emotional tone. There is a whole set of little typewriter pictures, called "pixes" on some systems and "bixies" on BIX, that convey emotion. For instance :-) is a smile, and :- ^) is tongue in cheek.

There are also limited clever uses of more elaborate typewriter graphics:

```
-- /!\
\'o.O' Ack Pffft Thwerpp
=( )=
U
```

to express disgust, for instance. These

elaborate ones are saved as macros so they can be inserted into messages with just a couple of keystrokes.

FLAMES

All this leads to one of the most common characteristics of conferencing: The dreaded flame.

A flame is a heated message aimed at another person. They can be one of the largest headaches or most entertaining features of a computer-conference.

Flaming divides into two categories. There is recreational flaming for those who are in the mood for a good argument. Then there is serious flaming for blood.

Recreational flaming is like a verbal water fight. For some of us it relieves tension to find a political opposite and tell him exactly why he's wrong. I can even give him advice on how to change his ways.

Verbal fencing may be fun for a while, but some subjects such as MS-DOS versus UNIX, certain social programs, and the ever-popular Republican/Democrat are called Rwar's. Rwar's, or "religious wars" have a high emotional content and a low probability of final solution in 200 word chunks.

Serious flaming is another matter entirely. It is a violent disagreement carried on at close range. The feedback from the combination of immediacy and lack of direct contact means a serious flame can quickly get ugly.

The feedback and lack of face-to-face contact tends to raise the level of verbal violence well past where it would go in other media. People routinely say things

in flaming matches that would get them punched in the nose in a face-to-face meeting.

A conference where a serious flame is going on is like being in the room with people who are arguing violently, which is to say uncomfortable for the non-participants.

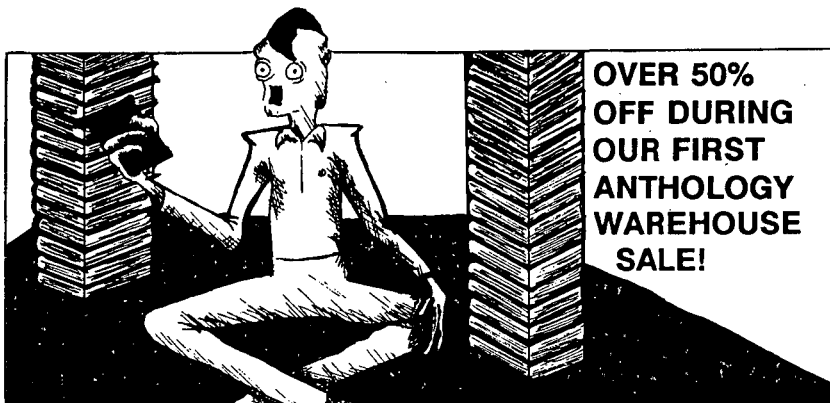
Flames also tend to pull in the bystanders either because they support one or the other position, because they feel someone is being picked on, because a side remark hits one of their hot buttons, or simply because they are fed up with all the shouting.

As a result the sheer volume of messages generated by a good flame can be awe-inspiring. One of us (RC) just checked one particularly active conference on BIX and found more than 250 messages posted in the last 24 hours.

But the worst thing about flaming is that it drives people away. Non-participants will resign or stop logging on, diminishing the community. Most systems try to hold down the flames without killing discussions.

There are definitely winners and losers in flaming. What usually happens is that one or the other party will be overwhelmed, either by the volume or quality of the opposition. In a serious flame this usually results in the loser quitting the field—and sometimes going back and deleting all the messages he or she posted.

What almost never happens is conversion. Once the serious flaming starts it is very rare for the person on the receiving end to change his/her position. This is true even if the original con-



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tention is completely wrong-headed and opponents drag out reams of references and statistics to contradict it.

Sometimes flaming becomes a method of social control. This is the "Queen Bee effect," especially common on local boards. An extremely strong personality will come to dominate the board and anyone who disagrees with him or her (Queen Bees come in both sexes) will be driven off, leaving the Queen Bee and friends as the main members. The Queen Bee isn't necessarily the sysop, but in a very real sense it becomes "her" board.

FLAME RETARDANTS

How do you keep flaming under control? The primary answer is self-restraint. You very quickly learn to curb your impulses on a network. The wise confencer expresses disagreement more moderately on the net than he or she does in conversation.

Not only does it avoid arguments, it avoids later embarrassment. Since your messages are public and can remain for weeks or years, intemperate or silly things said in the heat of flaming can come back to haunt you. This is one of the reasons for the unwritten rule that you never BIX drunk. Otherwise you may leave messages you regret embedded in the conferences like fossils in rock strata.

Personal restraint aside, there are other methods of controlling flames. Because flaming is such a problem, most conferencing systems have a series of rules and behaviors designed to quell flames. Perhaps the most important rule is to attack the message, not the person

behind it.

Another key element in holding down flames are the conference moderators. A moderator is combination referee, discussion leader, and pot-stirrer. His or her job is to keep things interesting but not let them get out of hand. Most of the commercial systems have one or more moderators per subject area because it is a good way to keep traffic up. On local BBSs, the system operator (the person who operates the BBS) tends to serve the same function. But some systems, notably Usenet, don't use moderators.

Where there is a moderator, the moderator sets the tone and the house rules. Moderated systems vary from the free-wheeling to the rigid. Some of the commercial services are so tightly moderated it amounts to censorship. Others are more easy-going. Where there is no moderator, anarchy reigns. Sometimes it is benign, useful anarchy and sometimes things get completely out of hand. Usenet is notorious in the global village for the goings-on in its unmoderated groups.

The moderator has a number of tools at his or her disposal. The most common one is simply social pressure. A disapproving message or note in E-mail from the moderator will curb most flamers, although not necessarily without bitterness.

Another tool is moving the messages. On BIX most conferences have topics (sub-conferences) called "flames" and flame messages are put there. Anyone who isn't interested in the argument can resign the topic. It's not actually censorship but it's close since most people

won't bother to follow the "discussion" to the flame topic.

Not all of a moderator's work is connected with flame control. Moderators also try to keep the discussion going and more or less on subject. If several BIXen get off topic, then the moderator may yank an entire string of connected messages and put them in another conference or topic where they are more relevant.

OSTRACISM AND NET DEATH

Not all the natives of the global village are friendly. Some of them are touchy and a few are out-and-out terrorists.

This is a rather different problem from the occasional flames. There are some people who delight in stirring up trouble. The combination of anonymity, immediacy, and the knowledge that everyone has to read what they say brings out the worst in them.

These bozos are a real problem. The net isn't like a cocktail party where you can simply walk away. You are stuck reading this person's messages. As a result several mechanisms, formal and informal, have evolved to handle jerks.

The commonest is ostracism. By general agreement, the other conference members ignore the twit. On BIX this is known as "The Pledge" (capitals intentional):

Usenet has one of the simplest and most individualistic mechanisms: The "twit bit." When you set the twit bit on someone the system will not pass his or her messages to you. As far as you are concerned the person is no longer on the net.

Some systems can shut someone out of a conference or allow read-only access. Finally the moderator or system operator can throw the person off the system. This is "net death" and it is taken very seriously indeed in the global village. Usually it is only used for major, repeated infractions of the rules.

The original reason for computer networking was to obtain information. The network has evolved so that it serves as a data base with "30,000 intelligent front ends and no error checking." As Roberta Pournelle says: "Scratch BIXen and they bleed information."

While this allows you to tap into the accumulated lore of Humanity, it also requires that you become part of the accumulated knowledge. Many times I've taken an interesting question in one of the areas where I have expertise and worked on it for several hours. Then I post my answer, often just a line or two, and I may receive no acknowledgement at all. But I know that if I need information on anything from the specifications of the Soviet MIG-31 interceptor to the best places to eat in San Mateo, California, all I have to do is ask.

Of course, I have to ask in the right place. This can be complicated. There are more than 200 conferences on BIX with similar numbers on CompuServe and GENie. Local and specialized boards add thousands of more places to ask and answer questions.

This leads to another important measure of conferencing systems: Their signal-to-noise ratio. BIX has an unusually high S/N because it has a lot of knowledgeable people and because it is fairly tightly moderated. CompuServe and

GENie, because of their larger memberships, have a lower percentage of technically knowledgeable people and a lower S/N. Usenet, because of its university and industry connections, has even more knowledgeable people than BIX. However Usenet isn't moderated and its S/N is terrible. The good stuff is easily lost in a mountain of trivia, irrelevancies, and random flames.

MAKING THE VIRTUAL CONCRETE

Computer conferencing is about as abstract a thing as you can have. That isn't very satisfying to most people so there is a need to envision the environment in more concrete terms.

Hence BIX has the "sleazy bar," "tojerry/lounge" and similar conferences. In these places, the language and activities tend to resemble real world activities in bars and lounges. It can get out of hand, however, with Dom Perignon served in 55 gallon drums, alligators in the hot tub, and deliciously vivacious individuals of the opposite sex on the trapeze between the crystal chandeliers. One individual actually invented a scenario which wrecked the sleazy bar and built it back in two days (faster than most temple reconstruction) using a time machine.

This seems to happen on every conference. In the "clubhouse" of one bulletin board my (RC) wife frequents they have regular food fights. The rule is you can throw anything that's edible, and some of the combinations are remarkable.

Another way to make conferencing more concrete is to meet physically. A common geographical phenomenon is

the BIXbash, where local BIXen gather for dinner, often to greet a visiting BIXen (or perhaps just because they feel like it). This affords us an opportunity to actually place faces on the people we've come to know well. It can, however, result in some confusion.

"Oh, so that's what gharry (G. Harry Stine) looks like!"

"No, that's the waitress."

After the BIXbash the participants then get on-line to tell how wonderful (or disastrous) the party was. While this is nominally meant to inform non-attending BIXens of developments they may have missed at the meeting, it actually serves two other purposes.

First, it might convince the absent BIXen to attend the next bash. Second, it is a floating liar's contest to see who can make up the most outrageous story about the meeting.

("The aerial entertainment was nice. Gosh, Harry, I was pleased to learn that you know the Thunderbirds." Also reference HazMat teams, craters and staying ahead of the shock wave.)

"To all BIXen who didn't make the dinner; there was a change of plans. We didn't eat at the Greasy Goo Drive-Thru after all. Moneysmith surprised us with a chartered Concorde to Rio and the Carnival. The live entertainment on the plane was nice and I like opera, especially Aida, as much as the next guy. It's just that you shouldn't try to do stage productions with elephants on an airplane that isn't a wide body type."

Again, this seems to be a universal

tendency. Local BBSs have "GTs" (get togethers) that serve the same purpose. A few months ago one of us (RC) went into a Thai restaurant in San Jose and found most of the place occupied with the regular monthly gathering of Bay-area members of Prodigy.

As with any social group, friendships and alliances form on the network. Friends will back up friends in the midst of debate. Friends will also celebrate the small triumphs ("I just sold an article") and tragedies ("I've now received my hundredth reject"). One BIXen was even on while his wife was giving birth, alternating between putting progress reports up on the computer and being with his wife.

THE FUTURE OF CONFERENCING

With more people, wider bandwidths, more topics and much more message traffic, we are seeing the beginnings of software which allow the user to search for the right topic. The software doesn't actually answer a question, it just points you in the more likely direction. A similar problem is remembering that you saw a scrap of information months ago but you don't remember where or who posted it. We are developing more powerful tools to search the accumulated messages and find a key word in close proximity to some other key word or phrase.

Currently conferencing can't do much with graphics and images. That will change with faster communications and more sophisticated graphics handling software. As it does, the nature of the global village will probably change. If you can see the people you are talking

to (or an animated surrogate image) you relate differently than you do to words on the screen. This will bring new problems, new opportunities and new ways of communicating.

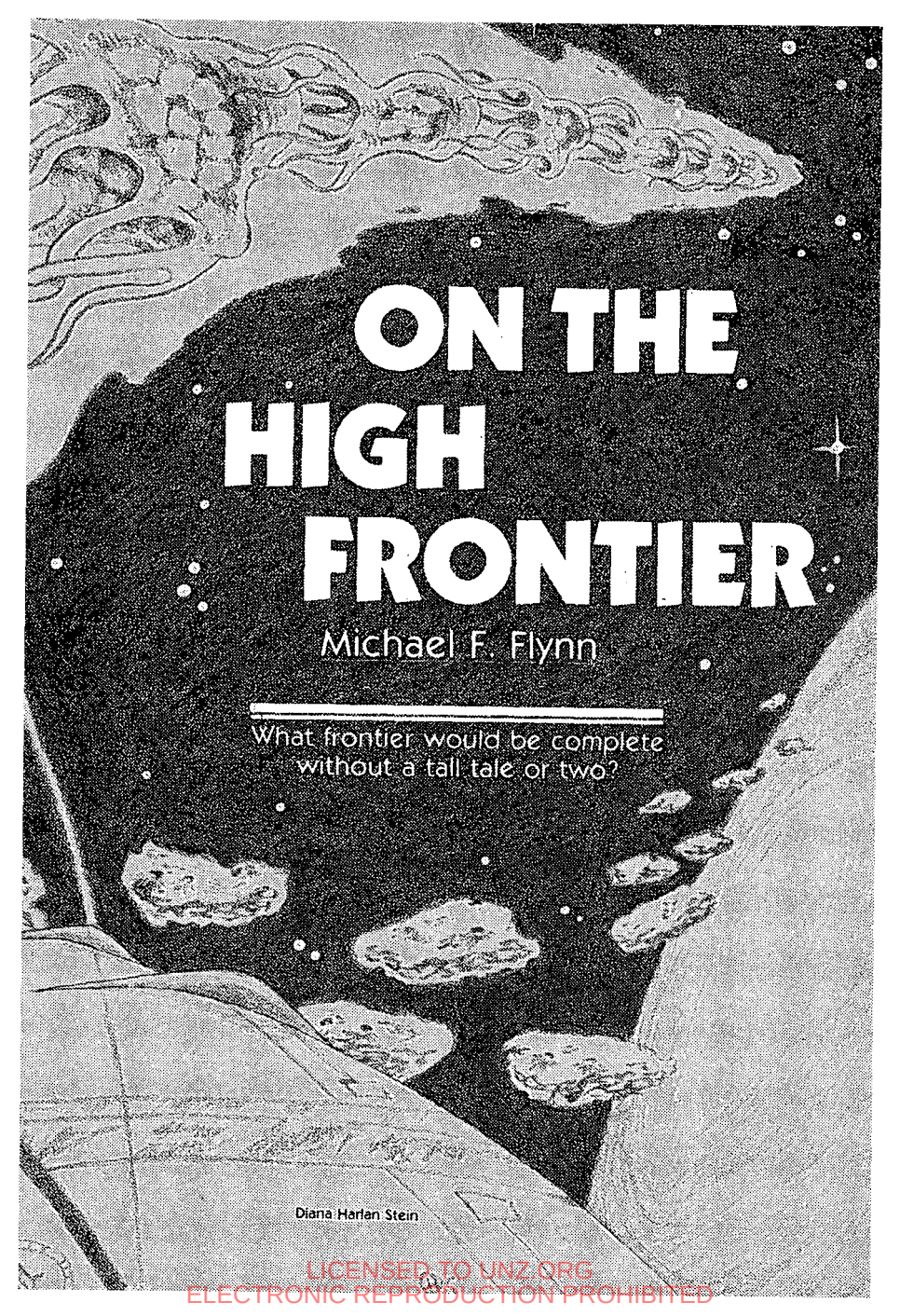
Ultimately, computer networking may merge with other services. Already most networks allow private E-mail, including the ability to reply, reroute letters, send carbon copies to others, and store and retrieve original documents. Today I can send a message to one special BIXen named DasNet and (for a fee) have my messages changed into a fax or telegram and sent anywhere in the world. We don't have real time video yet, although we can download video images from NASA's planetary probes and display them on our computers. We can also get weather maps or a continuous stock market ticker on some networks.

We have tracked projects while traveling with a portable computer and BIXing from hotel rooms. Thus, we have "virtual offices" wherever we go. With the new cellular phone modems the "office" becomes even more mobile. It's not always clear where a BIXen is even if his address is in his resume.

We are approaching the science fiction notion of total connectivity where we can send a message to virtually anybody in the world who allows access. This isn't total information, where merely asking a question sends a computer searching for the answer. I can get the answer but I have to know where it is—the "finding" part is left up to me. One of the ways to find that information is to log on to my friendly local worldwide computer net. ■



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ON THE HIGH FRONTIER

Michael F. Flynn

What frontier would be complete
without a tall tale or two?

Diana Harlan Stein

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1. I SEE THE WRONG END OF
BIG JIM'S PHASER.

It was in the Luckenback Wheel, falling around the Sun behind Uranus, where I first heard tell of Slim Wittelsbach and his hare-brained scheme to drive a thousand jellybellies into the Sun.

I was having myself a drink in Hard-luck Hashimoto's bar, a dead-head dive in the butt end of the Number Three spoke. The clientele there was never too savory, but the spin gravity was just this side of tolerable and Hard-luck never watered the drinks enough so you'd notice. I was standing there minding my own business and thinking harm to no man when another spacer gave me the elbow in the ribs, real deliberate-like; and so naturally I spilled my drink. In his face. Real deliberate-like.

Well, right off, I seen I made a mistake. It was Big Jim Callaghan; and he already had the drop on me. He was grinning ear to ear, and the aperture crystal on his phaser looked to be as big as the Ganymede light cannon. I kept my hand well clear of my own holster. I'm fast, mighty fast; but there ain't no one faster than the speed of light.

"Jim," says I with a nod, by way of sociable greeting.

"Ollie," he replies, "you are one clumsy spacehand. Give me one good reason why I shouldn't burn you down right here."

Now, offhand I could think of three or four good reasons, but I held my peace figuring Big Jim wasn't really all that interested.

Oliver Wendell Hatch is my handle. Mostly I go by Hatch, sometimes Dell; but somewhere or other Big Jim had found out how much I hated my front

name and he never missed a chance to "Ollie" me. Which just goes to show he wasn't near as smart as he thought he was. If he wanted to goad me into fighting, he should have tried "Wendy."

I looked around that barroom with tolerable interest. A man's fights are his own, but I wouldn't have minded one bit if someone wanted to borrow a piece of this one. Share and share alike, my Pa always said. But the other spacers in the bar seemed terrible interested in their drinks or in their poker games or in being somewhere else. Some had hid themselves under their tables; and one or two were taking bets. I wondered what odds they was giving. Long ones, I suppose. I didn't blame them none for minding their own business. Big Jim was nasty, but he was the *niciest* of the three Callaghans. Sergei and Konrad would not think kindly on anyone who interfered with their baby brother's fun.

There was one fellow, a thin, olive-skinned stranger in the corner, studying us with narrowed eyes. He wore a red and white striped skinsuit that I didn't recognize, wet with condensation, like he'd just orbited in from the Big Empty. He was toying with a set of balls and watching with what I took to be a professional interest.

Hard-luck himself was just a-waiting. Violence weren't new to him. He'd been in twenty, maybe thirty fights outlawing down to the Trojans back in the nineties, with nary a scratch to show for it. But since he retired and opened his bar, he's lost three fingers and his right ear, all as a bystander. There wasn't a fight took place anywhere in Luckenback that didn't wing him somehow.

Like they say, Hard-luck.

Big Jim was trying to rile me up by talking about my family; but it didn't bother me none, not being hot-tempered like my brother Sheridan. And truth-to-tell, my sister Felicity *did* have some mighty peculiar ways about her. Big Jim was grinning and laughing. He was having himself a powerful lot of fun. Me, I've had better times.

Pretty soon, though, Big Jim would realize that I wasn't about to draw to a stacked deck, say the hell with it, and burn me down anyway; so I fell to considering. The idea was to get him to point his phaser somewheres other than at my belly button. But it wouldn't do to point behind him and say, "Looky there!" Big Jim had his faults, but dumb wasn't one of them. If he thought I wanted him to look to the side, he'd never have done it. But let him think I didn't want nothing of the sort, and he'd just kind of naturally get curious. So I let my eyes drift ever-so-slightly over his right shoulder, my intention being to make him think I seen something I didn't want him to see.

Wouldn't you know it. I *did* see something I didn't want him to see. I jerked my attention back to Big Jim's ugly face just as the olive-skinned stranger whupped his arm around and let fly. Old Jim, he scowled and turned his head to the right just a little bit.

And that was enough.

I given my *kiai* yell and pivoted into a *mawashi-geri* kick to Big Jim's gun arm just as the stranger's bolo wrapped itself around his neck. The phaser discharged, but missed me by an easy centimeter. I grabbed his gun arm and twisted, the phaser dropped to the deck,

followed a moment or two later by Big Jim himself, choking and clawing at the bolo. Everyone in the place, Big Jim excepted, let out a deep breath.

The man in the red-and-white came over to the bar. He wore a pencil-thin moustache and, underneath it, one of those quiet smiles you see on folks who have just accomplished a difficult task. I nodded to him. "That was mighty fine rope work, stranger. I sure would admire to buy you a beer."

He made light of it. "It was not the most difficult cast I have ever made, senhor. My target was in the same acceleration frame as I was; and he was not even moving. A slight correction for the Coriolis and. . . ." A polite shrug of dismissal. "It was not a fair fight."

I wasn't sure which part he meant; but I wasn't about to waste no tears on Big Jim Callaghan. He'd come looking for trouble and he found it. Not many men achieve their goals so quickly.

Hard-luck brought two beers over. He was limping slightly, for Big Jim's light pulse had ricocheted off'n a mirror and caught him in the left buttock. For himself, Hard-luck would probably not have a mirror in the whole place, but most space hands have a hankering to know who's behind them.

The stranger introduced himself. "I am Dom José Fernando da Silva Rodriguez y Yamamoto, from Alto São Paulo,." He bowed slightly, equal-to-equal, and offered me his card. I took it, using only one hand, and glanced at it, as politeness required. Strictly speaking, I should have used both hands, but I never did have a good sense of wabi, and I never like to have both my hands occupied anyway.

"Mighty proud to make your acquaintance, senhor Rodriguez-san." I handed him my own card, completing the meishi ceremony.

Rodriguez studied my card and his smile broadened. "*O senhor* Hatch! Such good fortune. You have ramrodded jellybellies, I have heard. For Stan Mitsui up in Mim's Reach."

"Off and on," I admitted.

"And later, you were, segundo for Mercedes Nakamura-Jones. She spoke highly of you."

"You seem to know a lot about me, senhor."

"Enough to know you may be the sort of man we seek."

Now, when a fellow tells you that, it's always a sure sign of trouble, so I should've known better. But I was curious and full of good humor due to not being dead; and besides, it don't hurt none to be polite. "So, what's the job?" I asked and took a long pull of my drink.

He leaned close and whispered. "We propose to take a herd of jellybellies down to the Saturn ringhead."

I choked and damn near sprayed him with the beer. "Drive critters to Saturn?" I said. "That's plum loco! Why, the solar wind'll tear them apart." In those days no one had ever taken critters farther down than trans-Neptune.

"Quiet, please," José said between clenched teeth. His eyes darted around the bar room. Then he took me by the elbow and steered me into a private booth. "Cloud has men everywhere," he said when he had pulled the privacy shield and settled into the seat across from me. "I may have been followed here."

"Cloud?" I said leaning closer and dropping my voice, as folks generally did when Cloud's name came up. "Cloud is in on this?" Henri Cloud owned the Starwheel spread, up transPluto way. He ran the biggest herd of jellybellies this side of Aries and was a man to walk carefully around.

"No, senhor. But if Cloud knew what we were attempting, he would do his best to stop us: My employer is *o professor* Federico 'Slim' Wittelsbach." José sat a little taller at the name. "He who discovered the method of producing stardust from jellybellies."

Stardust. Just say the word in any saloon or teahouse on the high frontier and heads would turn and eyes would narrow with thoughts of riches. Stardust did something—don't ask me what—that slowed down aging. Taken regular, a body need never die; leastwise of old age, which I didn't expect to apply in my case. It was the elixir of immortality. It tasted pure awful; but I never heard no one complain.

"Slim Wittelsbach," I said, running the name around the inside of my mouth. I washed it down with a beer. "Never heard of him," I decided. Leastwise, his name was not in my ship's computer, which I had accessed through my skull implant and tongue switch. "And besides, it was Cloud who come up with the stardust."

"As most people have been led to believe," José murmured. "Cloud and the Professor were once partners. Senhor Wittelsbach-sama made the discovery; but Cloud made the riches. You understand how it is with some men."

José filled me in. It often happens that

a man real smart in some ways is a damn fool in others; and the professor had been a fool in his choice of partners. Cloud was a sharp operator. He could gut a man faster with a piece of legal paper than most others could with a phaser. Wittelsbach had gone to Cloud for his seed money, but before he knew it, he was on the outside looking in. "So, your professor sees a chance to even the score," I guessed. Real shrewd guesser, that's me.

"*Slim*," said José. "The professor has been quietly breeding wind-resistant critters on his own rancho. A strain that may withstand the rigors of the seventh orbit. As you know, the ring head is nearing Saturn. If we can establish a herd and a processing plant there, we can ship stardust by ion train anywhere in the Inner System. I am sure you see the financial advantages of such a move."

That José was a smooth one; I give him that. Most of the herds run out cis-Pluto way, where the orbits are powerful slow. So, a lot of times a customer's habitat would be behind the Sun; and the ranchers either had to wait so the shipment could rendezvous at conjunction—and waiting cost them bank money; or they would try shipping to quadrature or even opposition, which was tricky and used up a lot of ΔV . Either way, it was expensive. But down in the Inner System, the ion trains ran through the boosters on a regular schedule. A ranch set up near a ring station could ship anywhere, anytime—and undercut everyone's prices, Cloud included.

Cloud would be unhappy.

José give me the eye. "Well?" he

says. "What do you say to my proposition?"

I snorted. "It is the craziest dang notion I ever did hear. The High System is wild country, full of Oort storms, hawkingholes, and anhydrous deserts. No one's ever taken a herd through it. And a critter's instincts is all against going down-System. For which I can't say I blame them, seeing as how the flux density would kill 'em. They'd panic for sure, spread their wings and stampede up-System with the wind at their backs. I'd say the odds in favor of pulling off your drive are mighty low, and once Cloud cottons on they'll drop down a black hole."

"It will take a special breed of hand to keep them headed nose down," José agreed. "Men with the bark on them."

I shook my head. The professor was fixing to pull a fast one on the most powerful man in the High System by driving a thousand critters where they did not want to go. Hell, a spacer would have to be plumb crazy to sign on for a drive like that. I was right flattered he'd thought of me.

I opened the privacy shield just in time to see two of Hard-luck's boys dragging Big Jim off to the recycler. Seeing as how Jim had no more need for it, José retrieved his bolo. I watched the body out of sight. We all die someday; only Big Jim had had the rare privilege of picking the day himself. There wasn't anyone would miss him.

Excepting his two brothers.

Thinking on them two made me suddenly wishful of being elsewhere.

I considered it some; and, you know, next to the thought of those Callaghans a-gunning for me, driving a thousand

giant space-dwelling ameboids halfway across the Solar System was looking like a right fine idea.

2. I TORCH OUT OF LUCKENBACK WITH UNSEEMLY HASTE.

José and me split up when we reached the Hub. The way I figured it, them Callaghans would be looking for two spacers traveling together, so our chances would be better if we orbited separately. José agreed and gave me a chiplet with the professor's orbital parameter, and we agreed to rendezvous there.

Then I grabbed hold of the tow cable and rode it out along the north hitching pole. Them hitching poles was quite a sight. The tubes ran for miles out either end of Luckenback Hub, but were decoupled from its rotation. Most spacers berthed their cyberships there rather than park them in the livery dock. A body never knew when he might need to leave town in a hurry.

Like now.

When I was close enough to my slot, I tongued my implant and hollered for Belle. "Light the torch," I said. "We're cutting loose!"

"What's wrong, Hatch?" Belle transmitted back. "Someone's husband finally catch you?"

"No joking, Belle. There'll be a pair of Callaghans after me too soon for liking. And that's a pair I'd not like to draw to." Not that anyone in the bar had anything against me personal, but by now someone had surely called Big Jim's kin. For the entertainment value, if for nothing else.

"A pair is one Callaghan less than I remember," she said.

"You're a lightning calculator, Belle."

"Aren't I just. They didn't wire my brain into all these circuits for nothing. Tell me, turning three Callaghans into two is a tricky bit of arithmetic. Did you perform the subtraction yourself?"

"No, but I helped out some."

I let go the tow cable and momentum carried me toward the lock. Belle popped the hatch on cue and I sailed through the umbilical right into her couch. I seen her readouts was all green, but I never expected less. Belle is a good ship. We'd been through tight times together more than once.

In a peculiar way, she and I were mirror images of each other. I had a computer link implanted in my brain, while Belle was a brain implanted in a computer. Belle never spoke of what it was that made her have the ultimate transplant. That was The Subject We Don't Discuss. For some folks it was body damage so bad that not even nanomachines could repair it; for others it was the adventure of being "wired-in." Belle never said, and I wasn't one to pry. She'd tell me when she was good and ready. Meanwhile, she was the best cybership I'd ever teamed with.

I was already wearing my skinsuit, so as soon as I was buckled in, Belle dropped the magnetic tether, blew the umbilical, and hit the jets. We must have torched out of Luckenback at three gees. Leastwise, that's what my ribs told my backbone. It was a killing pace and neither Belle nor I could stand it for long, but what I craved most just then was kilometers.

That was my good-bye to Luckenback Wheel and the whole Circum-Ura-

nian Republic. I'd had some good times there and was right sorrowful to see it in my aft viewscreen. But I was tolerably fond of my own skin as well, and meant to keep it with no more holes in it than I'd started out with.

After a few minutes of boost, Belle cut the torch and we coasted through Hydrogen Flats, a cluster of cheap habbies balanced on Uranus's forward libration point. "Where to now?" she asked.

I fed José's chiplet into her memory and let her think about how to get to the professor's spread. A spacehand setting out into the Big Empty must give it careful thought. Madeira's constant boost torch put the Solar System within reach, but it ate hydrogen at a prodigious rate. Best to travel at a moderate boost and conserve hydrogen. Many a hand has come to grief with his ship tuckered out megaklicks from the nearest gas cloud. The Big Empty is mighty big, and mighty empty; and a spacer lost or a ship wind-blown can be powerful hard to find, bright colored skinsuit and beacon or no. For the same reason, a spacer must also be aware of where the nearest air and water could be found and lay orbits so they was never too many ΔV s off.

Belle laid out our orbits, but I put my own mind to it as well, casting our horoscope by downlinking through Belle's astrogation sensor array. A good spacer always keeps the zodiac to hand, lest he become lost; and astrology is something he just naturally soaks up with his mother's milk. We were starting out near the forward edge of Virgo, with Earth just east of the Sun and Saturn entering Pisces. The professor's

habbie was in Sagittarius, in cisPluto. Call it 4500 megalicks, straight trig. Belle could maintain a constant boost of one deci-gee almost indefinitely without tiring, provided she could drink enough hydrogen along the way. Since we'd been ballistically coupled with Uranus, we had a starting velocity of 6.8 kisses. Add a little Kentucky windage and I figured it to be a seven-week trip. By the time I reached the professor's spread, Earth would be in conjunction and, for that angle, Saturn would be in Aries.

Seven weeks was plenty of time to bone up on jellybellies. I told Belle to get me a library link; then I sat back and waited. The main library was in Jovian orbit, but there were relays scattered all around the High System. According to the ephemeris, the nearest one was Ny-eschastye Light, a navigation and booster laser for lightjammers. Belle would find the shortest relay path through the system; but even if the DataBank was in conjunction I'd have to wait four hours for a reply, so I selected a *koan* at random and meditated upon it. I had no *roshi*, of course, but what better place for *za-zen* than the Big Empty?

When the link was finally established, my mind was in a proper state of readiness, having been emptied of conscious thought. The files could download holographically. There are some spacers who can't handle their implants that way. They bring the data in linearly, like they was being read to. That's powerful slow. Pa, he taught us the *zen* way. In his younger days, he'd spent time back down in the Inner System, and he'd picked up some of their

ways. *Matsushita-Bandierantes* and the *keidanren* no longer dominate space like in colonial days, but many of the old Nippo-Brazilian customs still lingered on the frontier.

Pa had always insisted that his kids be literate, so he taught us how to read, write, cipher, and hack. I knew some damn fine spacers couldn't do none of that, but I had it in me to better myself in life. Downsystem, it mattered a lot if you was born into the right families and had the right manners; but up here there was no limit to what anyone could make of himself.

When the jellybelly file dumped into my head, I "remembered" things I'd thought I'd forgotten; plus I learned a sight that was new. Which weren't no surprise. Quantum-biologists are always discovering new things about those critters. I mean, what *can't* you learn about something that's part jellyfish, part whale, part tent caterpillar, and part radio set; and not one bit like any of them? Scientists were still arguing about how to classify them. Me, I just called them critters, when I wasn't calling them a damn sight worse.

It used to be folks thought chemical reactions couldn't take place in open space. There wouldn't be enough energy to move the molecules over the activation barrier. But as far back as the twentieth century, a Russ named Vitaly Goldansky showed that quantum tunneling through the energy barriers between potential wells would allow chemical reactions to proceed even in the cold of outer space. Some folks synthesized formaldehyde and other long chain molecules at 4° Kelvin, which showed that organic compounds, maybe

even life, could evolve in the Big Empty.

Still, space-life took most everybody by surprise; though the biggest surprise of all was that it was related to Earth-life. At some deep down level, men and ferns and jellybellies was kin. Of course, compared to a jellybelly, men and ferns are practically twins. The pan-Spermians had always held that life on Earth (and, later, on Titan) had been seeded from space, and it sure looked like they'd had the straight skinny all along. Somewhere down the line a few hardy spores must have made it through the Inner System and dropped into the Earth's chemical soup, precipitating all kinds of stuff, like dinosaurs, roses, wombats, and pretty girls.

However it happened, the High-up System, where the solar wind is weak and space is near flat, was full of things that acted like plants and things that acted like plant-eaters, just a-drifting abouts in the Big Empty. It stood to reason that there must be predators, too. There weren't near as many jellybellies as there ought to have been, so something must be harvesting them. No one had ever seen a "space-wolf," but then no one has seen everything. And there *were* stories that made the rounds whenever spacers gathered. About things heard and not quite seen. About spacers who had shown up missing.

Some folks called those tales foolish and laughed at them; but there were others as said nothing, and they didn't laugh at all. For myself, I kept an open mind, a wary eye, and a fully-charged phaser, that being a good idea in any case.

Now the jellybelly is a somewhat

comical critter, though in its native habitat it could be darned majestic. The two are not so different. It was shaped like an enormous jellyfish, but it wasn't multi-cellular. On the other hand, it wasn't exactly single-celled, neither. There was something topologically peculiar about it, something to do with the quantum dimensions of Nagy's hyperspace. So, the scientists, they called it semi-cellular, just like they knew what that meant. Me, I only knew what scraps of quantum biology and hyperspace physics I picked up in saloons from other spacehands. My implant could give me plenty of data, straight from the Jovian DataBank if I put my mind to it; but understanding was quite another matter.

Jellybellies grazed mostly on sky-crop, the plantlike things that drifted about the High System. One feller told me sky-crop was like plankton in the seas of Earth and the jellybellies was like whales, which may be true for all I know. But critters could feed right off the hydrogen, too, which my implant tells me whales cannot. The nutrients are carried by supercooled helium, which crawls like a kind of living blood around the outside of the critter's membrane and fluoresces all over the spectrum. A downright eerie sight to behold.

Jellybellies moved by expelling digestive gasses. They traveled in herds and called to each other on radio frequencies, singing songs somewhat like Titanian ice flowers, or those Terran whales I heard tell of. When they moved, they lined up along each other's magnetic fields. If you could get the lead bull headed the way you wanted, the rest would generally follow. Critters

wasn't very smart, ranking in intelligence somewhere between a turnip and an overripe melon; but, hell, I'd known a few people here and there who'd gotten by on less.

If you can imagine hundreds of neon jellyfish farting through space with their noses stuck up each other's arse, playing their favorite tunes to each other on the radio, you can see how a spacer riding herd might develop a peculiar outlook on life.

3. I AM CUT OFF AT THE PASS.

Meanwhile, I'd been keeping a sharp lookout on our backtrail. I didn't think for one minute that those Callaghans would give up. Say what you will about them—and I've said plenty—they took care of their own. But, after a couple days with no sign of pursuit, even with my sensors at maximum gain, my mind was resting somewhat easier.

Belle and I decided we would need water before we reached the professor's habbie. Torching out of Luckenback, we had used up a lot of mass. Even though Belle's hydroponics produced some water and we recycled all of it, there was always losses, and the levels in the tanks were giving me concern. Besides, a spacer is always mindful of what his drinking water is recycled from; so the desire to freshen our stock was in me, and I commenced to give thought as to how I might do that.

We were passing near a stonebuster's habbie, but we did not slow down nor call out, since I was not wishful of drawing attention. What a man notices, he may repeat to others, even unwittingly. Anyway, a stonebuster would have little water to spare, even if his

ballistic sling could match my orbit and speed. He was growing wheat and would need every drop of ice he could mine from his asteroid. He had upgraded his rock with a hawkinghole, which gave him enough gravity to hold an atmosphere; and sunlight he collected with a lens-and-mirror assembly ballistically coupled to his habbie. A hard life and a lonely one; and one that didn't need me dropping in to make it harder.

However, finding water was not that difficult. There was plenty of ice locked up here and there around the system. The trick was knowing where to look.

When spacers get together in saloons or teahouses, they naturally talk about the places they've been and the people they've seen. Where they'd found water ice or hawkingholes; or who was building a reputation as a rough man. The rest of us would be of a mind to listen and remember, since a body never knew when such knowledge would make the difference between life and death. Maybe computer implants didn't help us think better, but they sure did a wonder for the memory. Spacers who had never been there could describe the orbits of Mendoza's Moonlet and Deadman's Hole, or say where the water-ice fields lay on Charon; and could detail down to the last scar the face of Toshiro ten Boom, the outlaw-turned-lawman who was now town marshall in Tokkuri Kosho Wheel.

So I knew there was four asteroids and two cometheads holding water ice that lay near our present orbit. Two of them we could access without a major alteration of vectors. I asked Belle her opinion.

"Threadneedle. Comethead," she told me, with even less delay than usual for her. "It has the lowest ΔV ."

Now, I did wonder a might at that. Threadneedle had a bad reputation. It was part of a ballistic triplet with two black microholes that were slowly consuming it . . . plus anything else that got too close. A dang sight more spacers had gone up that pass than ever come down. "The gravity cliffs there are awful steep," I reminded her, as if, being a computer, she needed reminding. "I wouldn't want to fall down a hole."

It used to be they called microholes "cold, dark matter," before they learned better. Microholes didn't evaporate like they was supposed to because most of their structure was curled up in Nagy hypospace, underneath the floorboards of the universe. The Nagyists say that microholes are scattered randomly through hypospace, like the Big Bang says they ought to be, but they still form galaxies and clusters and such like because we can only see them "edge-on." Like if you splatter a passel of dots on a sheet of paper, then look at the paper from the edge, the dots will blend into a line. Well, the edge is our space-time and the rest of the paper is hypospace.

Leastwise, that's how Belle once explained it to me. There was some spacers who said that if'n you went down one hole, you would just pop out another somewheres else in the universe. I plan to wait for one of them folks to come back and tell me which one, which ain't happened yet.

Belle told me her plan. "It's simple, 'Dell. We come up from the west, behind Threadneedle, and follow the pass,

where the three gravitational fields balance. That takes us directly over the north face of the comethead—or under the south, if you like. We blow off a chunk and scoop it up without slowing down, then go straight out the spinward pass.”

It was a tricky bit of maneuvering. Our constant boost had built up a respectable velocity, which wouldn't leave much reaction time to correct errors. “You're saying you can do it.”

“Hatch, I wouldn't have recommended it otherwise.”

Another point in its favor: Being so treacherous, Threadneedle did not attract crowds. Folks didn't exactly line up to be sucked into holes. Since I was signing up for a suicide critter drive and had two vicious killers a-chasing me, one more crazy risk hardly seemed to matter.

Over the next few days, as we boosted toward Threadneedle, an uneasy conviction grew on me that the Callaghans would be there a-waiting. I couldn't prove it, but I *knew*. Sometimes it's hard to tell intuition from subconscious hacking over the datalink. Calculations showed that they could beat me there easy if they boosted their ships ragged; but even if they *could* beat me to Threadneedle, how would they know I would go there when I hadn't known myself until a few days ago?

Now, the notion was so unlikely that I worried at it some, trying to get at the root of it. Common sense said that the Callaghans were far behind us, cutting for sign; or maybe even following José, instead. Insiders and Downsiders don't rightly appreciate how easy it is to track

another ship across the Big Empty. They forget that our senses are slaved through our ship's EM sensor array. We can “see” by radar—though you have to know where to aim the laser pulses—and we can “hear” by radio. With neural implants, it *feels* like seeing and hearing. And out in the Big Empty, there's a lot to see and hear.

Most spacers grew up reading sign. Space is not a pure vacuum. It is full of gas and dust which can be disturbed by the wake of a ship's passing. It's powerful thin stuff, but a top hand can give study to the dust and figure how many ships have passed through, how long ago, and in which direction. Such things being often a matter of life and death, it can concentrate the attention remarkably. Of course, being downlinked to your ship's mini-cray helps a lot when it comes to doing the figuring.

A tracker also gives thought to emissions. No two engines are alike. They differ in their nozzle configurations, their state of repair, the impurities in their fuel, and so on; so that every jet plume leaves a unique spectrographic footprint, one that can linger for months before the solar wind or an Oort storm erases it. A top hand can tell from the impurities in the exhausts where the ship last took in hydrogen; and from the density and spatial pattern of the plume what ship it was and whether it had fired its orbital transfer jets. The size and shape of the footprint, as we say.

A space hand also listens hard, since sound carries in space. Well, not sound, but EM noises, like I said. You can hear things quite a ways off: radio chatter between spacers, ships beacons, even casual sounds accidentally picked up and

transmitted. A spacer learns to identify the natural sounds around him: the hiss of the hydrogen, the chuckle of Uranus, background noise from nearby habbies, and so on. An out-of-place sound or radar echo may be the only warning he gets of danger.

Belle and me, we'd been almighty sly and left precious little trail to follow. When we transferred orbits, you never saw such tiny puffs of reaction mass; and we fought shy of settlements, lest someone there remark our passage. We even avoided hydrogen clouds, 'less Belle needed a drink. Belle took us through a sunstring—the remnant of a solar flare—drifting across our orbit. Slowed us down a might; but its spectrum had so much junk in it that the Callaghans would need some right fine instrumentation to pick out our particular pattern. A top tracker might still be able to follow us but he would lose a lot of ΔV doing it. Truth to tell, I'd no idea whether those Callaghans were good trackers or not, but I was not terrible eager to find out; and there sure weren't no point in making it easy for them.

Yet, for some reason, some advice my Pa had given me kept running through my head. He'd been a canny man, given to good advice, which I kept in a locked ROM directly hardwired to my implant. After Ma died, Pa had gone yondering up Oort way and he never come back. I missed him something terrible. A machine persona ain't nothing like the real thing.

A man leaves a trail, his voice whispered in my brain, not only in space, but in his mind; and the best way to follow him is to follow his thoughts.

I didn't know why he was telling me

that, since I wasn't following no one; so I guessed that a neural do-loop had got stuck somewheres on a random bit.

Like I said before, I wasn't born stupid, but I've had years of practice. It was only several days later that I realized what Pa's machine-ghost was trying to tell me. I commenced to cussing, something I am right good at.

"Problem, Hatch?" said Belle. "Or are you just trying to improve my vocabulary? I didn't even know that last one was possible."

"Only for hermaphroditic clones," I told her. "I must be suffering from terminal stupidity. Link me up to the library's diagnostic programs."

"Done and done."

I hacked for two days straight, waiting after each query while the radiowaves crawled down to Jupiter and climbed back. I cut for sign through the pseudo-memories and finally picked up the ghost of a trail, which I followed to its end. When I was through, I knew three things I hadn't known before—at least, not consciously.

It was a matter of public record that José Rodriguez was segundo for Slim Wittelsbach's jellybelly station.

It was also a matter of record that I had downloaded the jellybelly file a few days after José and me left Luckenback.

Both those records had been accessed by Sergei Callaghan.

So, they had followed my mind. They knew I was headed for the professor's place. They knew I'd left Luckenback without time to top off my water tanks, which meant I'd have to water up along the way. And they knew that only a damned fool would take water at

Threadneedle.

So naturally, they'd be there waiting for me.

I mentioned it to Belle and she agreed. "But we still have to go through Threadneedle," she said.

I put my mind to it and saw she was right. We had already passed the point of no return. The other water sources were no longer accessible from our trajectory. Too much ΔV would be needed to change orbits. Nor could we bypass Threadneedle entirely, since we would run dry long before reaching the next watering hole. That would only be an elaborate form of *seppuku*; and, while I am not afraid of dying, when my time comes I'd rather go down fighting than running.

"If we go up the pass, we'll be sitting ducks," I told Belle. "Even expecting trouble like we are, we'll come out the short end of it."

"Hatch, we've *got* to go to Threadneedle."

There was an odd catch in her voice when she said that. I wondered about it some, then thought I understood. If we went into Threadneedle to water up, we would both be killed. If we went on past, I would die of thirst, *but she wouldn't*. What right did I have to ask her to risk her life with mine?

"Maybe we *should* just mosey on by, Belle," I said, feeling noble and self-sacrificing as hell.

I waited for Belle's answer, but she was silent. Lights flickered on the control panel. When she finally spoke, her voice was angry.

"Well, I never thought I'd see it! Of all the ill-mannered, evolutionary dead-ends taking up space in this system,

Wendell Hatch, you surely do win the prize! You have no concern for me at all, do you? No solicitude for my feelings!"

Now, seeing as how I'd offered to sacrifice myself for her, I thought that what I'd just said showed more than a little solicitude for her feelings. "What do you mean, Belle?"

"Just how do you think I'd feel boosting all the way to Sagittarius with a thirsty corpse inside? Did you ever think of that? No, of course not. It wouldn't bother you at all."

Actually, I thought it would bother me considerable, so it was just as well she wasn't going to take me up on it. "All right, Belle. You win. If you want to get yourself killed along with me, why I'd be right pleased for the company." I felt real good that Belle was going to stand by me. Even if she wouldn't come right out and say so, I think she liked me some. A man out in the Big Empty had best have his ship for a friend, or else he may never need another.

"So, Belle, I guess we go in shooting; though I'spect that'll be only a different form of suicide."

"No, we won't, Hatch."

"We won't go up the pass?"

"No."

"And we won't bypass the comethread?"

"No."

"Well then, tell me, Belle, seeing as how we're both going to die real soon, just how we plan to do it?"

She did have a plan. It weren't much of a plan, but then I wasn't in any position to be real choosy. Her plan was to slingshot around the sunward microhole

and not come up the gravity pass at all. If we vectored around the hole just right, we could dip into it and get us some extra ΔV . Then we'd pop up over the ridge—the lip of the gravity well between the hole and the comet-head—blast off a fragment, suck vapor, and be gone before the Callaghans even knew we were behind them.

It sounded to me like a third and even more elaborate form of suicide, and we would wind up wherever it is folks wind up when they get sucked into holes. I'd heard stories from other hands about spacers who had tried the same maneuver at one hole or another, trying to show how they had the Right Stuff; but the stories were always told in the third person, past tense. Still, it didn't look like I had much choice.

"No one's ever done it before," I pointed out.

"Just once. At Threadneedle."

That surprised me. "I never heard. Who was the hand that done it?"

"It was me, Dell."

Well, that shut my mouth right quick. Belle and I had yakked up a storm over the years we'd been together, but she'd never mentioned this before. Which meant it was tied in with The Subject We Don't Discuss.

"You mean, Threadneedle's where you . . . I mean, where your body . . . Uh, that is . . ."

"I'll save you the embarrassment, Hatch. Yes. Threadneedle is where I became eligible for cybership status."

Well, that was one way to put it.

I gave it some thought. She had tried the maneuver once before, which was good. On the other hand, there was nothing left of her but her brain, which

was not so good.

"How'd it happen, Belle?"

"Prying, Hatch?"

"No." Yes, I was. Not many women take up the spacing life. Those that do are special. Belle had once been a real woman, with dreams and ambitions—ambitions that were now beyond any hope of fulfilling. Her consciousness had been saved, but was that a kindness? What kind of life could it be wired up to a ship's software? Still alive, sure; but alive as a *thing*. Seeing and hearing and speaking through hardware, and never, ever touching another human being.

I ran my hand along the frame of the console. Was it even worth living? Not for me, I thought. Yet, who was I to decide for another what sort of life was worth living? We each plot our own orbit, and our Final Docking depends on our own skills as pilots.

I discovered that I wanted to know Belle better. But I held my tongue. In space, people did not pry into one another's lives, lest invited. What matters is who you are, not who you were. Still, I couldn't help but wonder. We were returning to the place where Belle had lost everything: her body, her future, her dreams, nearly her life. What sort of scar might that have left upon her mind? And was that scar healed, even now? Would she hesitate at just the wrong moment, fearful of repeating the misstep of her previous visit? Had she, in fact, maneuvered me into coming to Threadneedle only to prove something of herself?

Naturally, I assumed she had fallen off the cliff into one of the holes and barely managed to escape. Which just

goes to show how wrong a body can be.

4. I PASS WATER AT THREADNEEDLE.

Belle made the course corrections that would whip us around the sunward hole. As we drew closer, I kept a sharp watch. Radar and visuals showed nothing on the western pass, but that was natural. There was enough junk—small asteroids, cometary fragments and such—to provide plenty of cover for anyone mindful of staging an ambush; and naturally, any bushwhackers would have their beacons turned down as low as they dared. Belle and I had cut our own beacon down to minimal just before we came in range.

I paid close attention to the pseudo-sounds. Like I've said, a spacer learns to distinguish natural from unnatural sounds. Right then, all I could hear was natural. The 21 cm. hiss of the hydrogen, the distant hum of Jupiter and Saturn, the electric halo of Uranus far behind me. The chatter of habitats all over the System blended into indistinct murmuring and chirping, from which individual sounds emerged only on occasion. From Nyeschastya Light and High Bakaskaya, which were closer, I could make out fragments of words. Far off, the sound of a rogue jellybelly drifted in my inner ear. I scanned the frequencies up and down the spectrum.

"There!" said Belle. "Did you hear it?"

Often a man's ship, having keener senses, will hear things first; and a spacer learns to trust his ship's reactions. So, when Belle's ears pricked up, I knew that something was out there. I played the vernier until I found it: three faint echoes. Ships' beacons, on mini-

mum. At this distance, I couldn't make out the identifying patterns.

"What do you think, Belle? I can't read the brands."

"There are three beacons," she pointed out, "and two Callaghans."

I shrugged. Odd as it might seem, the Callaghans did have friends. Men as rough as they were. Men so rough they wore out their skinsuits from the inside. And hell, all modesty aside, there wasn't any shortage of men willing to brag as how they'd burned Oliver Wendell Hatch. There's always those wanting to prove themselves fast. Me, I'm still here. I've always been fast enough; but it's accurate that counts. Accuracy and the sand in your belly to take it while someone else is shooting back. I don't draw my phaser often, but what I point at I generally hit.

I tongued my implant and fixed the locations of those three beacons in my mind since, when we topped the ridge next to Threadneedle, I wanted to know what direction the shots would come from. At that point we'd be making enough electromagnetic noise it wouldn't matter if beacons were on or not.

Space began warping and dropped away in front of us as we headed toward the hole. Light passing so close to the hole was warped, so even if they seen us they wouldn't see where we were. But when we came back around, we'd be skylined sharply against the event horizon. I swallowed hard. I was scared and I don't mind saying so. Anybody'd tell you different would be a liar. A slight miscalculation and we'd spiral all the way down to the bottom. —And a Hole has no bottom.

Just as we started in, Belle spoke. "Hatch? Remember what I said. No matter what happens, trust me; and keep your finger on the triggers. I know things about this place."

Before I could reply, she let out a shriek that near to blew my earphones out. A horrible wail at maximum gain: the distress call of a jellybelly. Those three beacons, they winked out right away, which shows their intentions wasn't friendly at all.

Well, we slid around that gravity well faster than a politician around a question. What with the acceleration from our turn and the acceleration from the hole's gravity, I didn't know which way was Down. Belle's body hummed and popped from the stresses. Somewhere aft I heard a sharp crack and prayed it was nothing vital.

Then we were up and over the ridge. The nose gun popped out of its scabbard and I let loose a blast. A small mountain on the comethead sublimed into vapor and Belle roped it in with the magnetic scoop before it could disperse. After all the trouble we had gone through, I surely did hope that it contained a goodly amount of water.

Belle spun on her gyros and lined us up on the eastern pass, all the while screaming like a wounded jellybelly. I figured her first screech might have fooled the Callaghans into thinking we were a critter fallen down the Hole; but now, after vaporizing part of the comet, we'd be showing up clear on their radars and they surely knew who we were. So I couldn't figure out why she was still screaming.

It was just dumb luck that saved us. A chance reflection on the radar caught

my eye. I slapped the steering jets and Belle shied off just as a streak of coherent light intersected our trajectory. I located the bushwhacker in my aft screen and my implant gave me his orbit. I laid three quick shots ahead of him and, just for luck, two more to either side, and that fellow, he rode right into one.

It opened his ship up like a can of beans, but I couldn't find it in me to feel sorry for him. He'd picked the game and set the rules, and if he'd gotten what he'd planned to give, why that was just too bad.

His two friends were coming up fast and we taken out of there, all jets firing. Our trick had sure fooled them, for they'd expected us to come up the western pass. Now I had water and a lead on them, which was good; but they were giving chase, which was not so good.

I started to tell Belle she could stop her screeching when I saw something I hope never to see again. It come up out of the Oort-ward Hole with a growl of static that wiped out half the spectrum and like to paralyze me with fright and surprise. It was about a quarter the size of a jellybelly and made of the same shimmering stuff, but it was spitting particle beams. A gossamer tiger with high energy fangs.

It missed me by a fraction of a second, though some of Belle's circuits shorted out from the umbra; but it got one of those Callaghans dead on. It was Sergei Callaghan, to judge from the faint beacon. I saw his ship flare briefly in my screens; then it drifted there, dead and silent, until that thing swallowed it up. I never set much store by those Callaghans, but I surely hoped' Sergei was dead.

I also hoped he would give the beast indigestion, which would be the only favor any of that crowd ever did for me.

I didn't see what happened to the third ship, which I guessed to be Konrad Callaghan, the third brother. He might have reined aside and fallen into the Hole, or he may have boosted free entirely.

Belle rotated on her gyros so we were flying backward, facing that monstrosity. "Kill it, Dell!" she shouted. "Kill that goddamned son-of-a-bitch!"

Well, that seemed like a real top-notch idea to me, so I commenced to shooting. Belle threw in random vectors with her steering jets, trying to keep us out of the beast's particle beams. She was wasting reaction mass like there was no end to it, and to tell the truth, I wasn't minded to ask her to go easy. Linked by implant like we were, I could compensate for her bucking and, like I said earlier, what I point at I generally hit.

It seemed like the fight went on for hours, but the chronometer tallied only fifteen minutes when it was over. Somewhere along the line, I must've hit something vital and eventually the news that it was dead reached whatever served the creature for a brain. It cried out one last time and my radio fell silent.

There wasn't a sound, except for my own breathing and the background murmur. Then, hesitantly, Nyeschastye and Bakaskaya began chirping questions. I wondered what they had made of the ruckus, which surely had reached them, being only light-minutes away.

"Keep shooting," said Belle in a flat voice. "I want that bastard deader than

dead."

I started to say something, then I shrugged. I loaded a scout missile into the launcher and let fly. When it had penetrated the monster, I set off the auto-destruct.

There wasn't anything left of the creature.

"Satisfied?" I asked Belle.

There was no answer. I looked at the readouts and saw that many of the panels were dark. One of the engineer boards was sparking where a circuit breaker had failed to trip. I hit the manual backup. We must have taken a few near misses in the fight. My skin tingled where the edge of a beam must have brushed it.

"Belle?" I asked again. This time there was real concern in my voice. To be out in the Big Empty without a ship was certain death. That's why ship rustling was a vacuum offense. Kinder to kill a man outright than to set him adrift. Even if Belle was only lamed, the symbiosis between human brain and ship's hardware was so intense that physical damage to the latter could cause psychological trauma as well. In extreme cases, euthanasia was the only alternative. I've never had to shoot my ship before. Belle and I had been through too much together for that possibility to sit easy with me.

Finally, she spoke. "Yes. I'm all right, Dell. I've . . . lost a few functions, is all. You can probably jury-rig most of them yourself, but I'll need a mechanic when we reach cisPluto. Those Callaghans gone?"

"Two of them are deaders for sure," I said. "Konrad might have gotten away."

"I've analyzed the gasses we took on at Threadneedle. There's enough H and O to make water and enough H left over for me to burn until we find ourselves a cloud. I used up a lot of mass in that fight. We're nearly empty."

Damn! She was near apologizing for saving our lives. If it weren't for her maneuvering during the fight, Sergei Callaghan and I would be doing lunch together. "There's a hydrogen cloud," I said, "about two weeks from here, to the Oort-Oort-east. It's along the way."

"Good. We can make that, no trouble. Ready to boost?"

It was obvious she wasn't going to talk about what had just happened, and I wasn't about to press her. I could hear the tension in her voice. She was dealing with some powerful emotions of her own and needed time to sort them out.

I checked around. There were papers, and odds and ends strewn around. Drawers had spilled open during our run through the Hole and the fight afterward. I put the thongs back on the gun triggers and began tidying up. When I picked up the papers, I saw my hand was shaking.

"You going to fuss around like some old bachelor," asked Belle, "or are you ready to ride?"

"Why, let's ride," I said.

We showed Threadneedle our jets and took off down the eastern pass. When we were back down in flat space, we set orbit for Professor Wittelsbach's habitat and lit the torch. We boosted high, to make up for lost time.

Now, it didn't need any kind of genius to realize that I'd fought whatever it was that preyed on jellybellies. Evi-

dently it hid out behind the ridge of bent light, where it was electromagnetically invisible, waiting for victims, somewhat like the trapdoor spider back on Earth. Evolutionary adaptation is surely a wonder. I allowed as how I would be more wary in the future when passing anything larger than a hawkinghole.

Nor did it require a genius to realize that Belle had lured the creature out of hiding by imitating a wounded jellybelly; and, putting 2×10^0 and 2×10^0 together, I figured to know how she'd been almost killed on her last visit. And why she'd been so ready to bring us here.

It must have left a terrible knot of hate and fear buried in her mind, and I couldn't say as I blamed her. Many folks have suffered losses, but few as terrible as hers. Considering how easy she could have let go and fallen into the hole of madness, it showed a great strength of character to have held on and crawled her way back to sanity. Being a ship may not be much compared with being a human; but life does go on and you either go with it or not.

I wished I'd known Charity Belle a lot earlier, but I was proud to be with her now.

She still wasn't ready to talk about it, but she would be someday. Now that the monster in the hole had been put to rest, the monster in her mind could be, too. Sharing a hurt is part of the healing, and there weren't no one more ready than me to shoulder that share.

For now, it was just good to be alive. There's nothing like not being dead to improve a fellow's outlook, so I threw my head back and commenced to singing. I can carry a tune as well as most,

though not so well as my brother Simpson; but Belle, she shut off all her internal audio pick-ups.

That didn't bother me none and I lit into some of the old songs, wrestling with *Pomnyu Ya* and *Red River*, and coming out, on the whole, victorious.

After what we'd been through, driving those jellybellies down to Saturn would be a Sunday picnic.

Though if I'd known then that I'd be riding orbit with a waldo, a clone, and a freemartin, I might have had second thoughts entirely. ■

IN TIMES TO COME

● The May *Analog* will be one of those uncommon issues with a cover (by Robert Murray) drawn not from a story, but from the fact article. It sets forth one of those brand-new brimming-with-potential ideas the aerospace community has come to expect from Robert M. Zubrin. You've read a lot about solar sails, but the magnetic sail, by interacting with the magnetic field of a star or planet, goes it one better. In addition to offering big reductions in cost of operations, it does such neat tricks as doing away with the concept of "launch window," allowing space missions to go when they're ready and willing and not just when "the planets are auspicious." If you don't believe that's a big advantage, just think about it. . . .

There'll be plenty of first-rate fiction, too, of course, including stories by J. Brian Clarke, Doug Larsen, and Dr. Robert L. Forward. I particularly call Larsen's piece to the attention of candidates and voters alike as the campaigns of a major election begin to heat up. Quite likely you'll find its core idea outrageous, but I can't think of a better time for *all* of you to think about it!



Frank Kelly Freas

THE STORY BETWEEN THE WORDS

Now why in the world would anybody want to be a science fiction illustrator, anyway? There's more money in lots of places, and sometimes just as much fun—like painting pinup girls.

There is basically only one reason for doing science fiction. It is simply more interesting, more challenging, more exciting, and less restricting than any other genre of illustration.

I have written (elsewhere and often) about the opportunity illustration offers the artist to move outside the limitations of mere self-expression, into an area where he can apply his abilities to the concerns of his whole culture. Consider, in what area *but* science fiction could the artist have such an opportunity to add a visual dimension to the endless variety of ideas being generated by some of the finest minds in the world?

Science fiction offers a chance to have a positive impact on our culture, bypassing both jellified thought-patterns and the frequently justifiable reluctance

of the general market to consider anything very far off trail. That science fiction both as art and literature has begun to get more general acceptance doesn't indicate a broader-minded public. It just means that the general public is more aware of us and our ideas through the media. It would be even nicer if it was able to read better, but let us nevertheless be duly grateful.

More than any other segment of the art world, and in spite of operating on its fringes, we have both a high degree of freedom to act and a reasonable chance of having an effect on the culture itself.

Why do I stress illustration over easel painting? Can't the mainstream artist have as much freedom and import as we can? Bluntly, no. Because the publications through which we work disseminate the *ideas* we illustrate—and eventually come back to us through cartoons, movies, videos, comics, etc. In the non-SF or *real* world you'd have to

be a serial ax-murderer to get the coverage we get routinely—and it wouldn't last as long. Ask Michelangelo . . .

Throughout history, the artist *has always been* an illustrator. (Just think for a moment how in seven thousand years of art, the art gallery has been with us for less than a hundred). Art has typically been a reflection of the world in which the artist found himself.

To date, the majority of stories readily available to us have been rooted in a Western cultural framework. I think you would agree that for good or ill, 2000+ years of Western thought has been based on Judeo-Christian philosophy/mythology, and the United States is—and probably shall continue to be for a while at least—an essentially Western culture. The effectiveness and continuity of any culture is founded upon the ability of its members to communicate with each other. I don't think science fiction (or fact, for that matter) has quite reached the stage of McLuhan's "global village," but we *are* becoming an international information exchange. Since communication itself is based upon a body of shared symbolism, much of which abides at the unconscious level, we obviously need to become familiar with the nature and variety of the thought patterns of the rest of the planet. We do not exist in a one-culture world. For example, it is going to become essential for us to learn and use the mythology of the East, and there can hardly be an easier or more direct method of doing so than through the visual techniques which are the illustrator's stock in trade. We hope.

Even English alone is hard enough to put into potent visual imagery.

As a dedicated professional illustrator for over forty years, I am painfully aware of the need for knowledge of this basic symbolism in order to translate verbal expression of ideas into immediately effective visual terms. In fact, in the last decade-and-a-half, more or less, I have found to my chagrin that what seemed to be an obvious reference was totally lost on my new generation of readers. This is a real and continuing problem, and shows every likelihood of getting worse.

For instance, what could be more obvious than my reference to Alfred Lord Tennyson's poem by titling my Skylab poster "The wonder That IS"? Apparently, anything. Doesn't anyone read Tennyson anymore? Then, to compound the stupidity, I titled my second collection of science fiction cover art *A Separate Star*, and got my tail thoroughly chewed by a couple of courageous friends. They pointed out that the juxtaposition of "Frank Kelly Freas" and "A Separate Star" conveyed a message of personal horn-blowing considerably more familiar to the public than Kipling's poem, which concludes:

*" . . . and each in his Separate Star
will paint the Thing as he sees it
For the God of Things as They Are."*

Perhaps it was an example of the disadvantages of a classical education: more likely it was simply a fugitive from *Reader's Digest's* "Fascination With the Sound of Own Words" department.



Since so very few students, if any, read the classics, learn poetry, have any grounding in philosophy—Western, Eastern or Abo—one seems to be reduced to taking one's symbolism from Tolkein (a very watery substitute for the Bible, or even Milton) or from Madonna and her ilk. Be that as it may, it is becoming increasingly apparent that some knowledge of the popular comics, as well as—God help us—television programs, is vital for an illustrator merely to communicate at the most elementary level. Anybody need a good housepainter?

Professionally, I accept the need to understand the new and fractured language; but unfortunately its use restricts communication to a smaller and smaller segment of our society as a whole. This is regrettable, not only as a serious professional problem but also as a sign of the incipient breakdown of *all* general communication. Where do I find *time* to familiarize myself with every subconscious argot from Korean to Bantu; and how do I talk to so-called Yuppies who don't know Tennyson from Nimoy and who couldn't care less?

It seems clear that biochemists can't talk to engineers, who can't converse with the scientists, who totally confuse the accountants, who upset the public relations people, who speak for the politicians, who succeed in manipulating their particular constituency via a total disregard for the accuracy or relevance of their data. Somehow, I can't believe that the present emphasis on a sort of Orwellian newspeak is going to improve the situation: especially when it

is applied to the new global culture.

Somebody once said that any organization, however bad, is better than no organization, because it provides the discipline and the framework—the skeleton—upon which improvements are possible. A skeleton can be modified and evolved to fit the changing needs of the organism, from fish to amphibian to reptile to man. An amoeba remains an amoeba, however happy it may be. Mythology, symbolism, and its disciplined expression in language is the skeleton of a society; and understanding it is the very foundation of communication both cross-cultural and internal.

Considering all this, we SF people are especially fortunate in being relatively free of that particular communications failure known as the *generation gap*. Most of us learned by the age of ten that communication per se was well-nigh impossible outside of SF, and difficult enough inside it. For 30 years we got away with talking to ourselves—even though we get a few odd looks at times—but somewhere along the line, a few of *them* started listening.

They—advertising, motion pictures, television, etc., etc.—had found a gimmick: science fiction, and I don't need to recount—again—the sad tale of the what they did with it. No doubt it is progress, for what that's worth.

But as a more or less coherent group, we SF readers are still fortunate. Oh, of course any large mixed group must have one or two nitwitted teenagers and a couple of middle-aged dunderheads, and no doubt we have some somewhere (though I'm sure none of us has met



any). But most of us can still communicate.

It is imperative for science fiction and fantasy illustrators to become educated (another dirty word) members of society, either by being self-taught or through formal training. John W. Campbell (the editor's editor!) knew what he wanted to publish with due regard for the need to educate the readers and to broaden their horizons. He never forgot for a moment that the primary professional objective was to provide entertainment: without *that* there would be no sales of magazines, and shouting into a barrel is singularly unrewarding. But having provided the entertainment—or better, in the *process* of providing it—a great deal of instruction, education, and general enlightenment could legitimately be included. *That* was our real reason for being. Furthermore, he said, if we did not have something to add to the consciousness and the well-being of the human race, we would be wiser to get a good, secure, well-paying job with the government or an advertising agency, and leave science fiction to those professional entertainers (i.e., writers and artists) who do have something to say.

Science fiction should be, to some degree, independent of mere contemporary trends or opinions. We are, after all, supposed to establish, or at least anticipate, the trends. Hah! The client will listen quietly, nod sagely and say: "Yes. We see what you mean. Now do it the way we told you," i.e., their way. Except in the rare cases where the VP in charge happens to be a science fiction

fan, "their way" usually consists of whatever is passing itself off at the time as art in the mainstream market.

This stuff is not necessarily bad. Some of it is actually superb. The *general* level of commercial art is incredibly good nowadays. But it just isn't science fiction and its thought patterns are not appropriate to the genre. That is where we, the science fiction readers, come in. It is not inconceivable that with so many excellent artists and imaginative thinkers out there, a genuine understanding of what science fiction is all about will in the end produce a whole new generation of illustrators whose abilities are attuned to the most valuable genre of literature our culture has so far produced. It has been said that those who know no history are doomed to repeat it. Even thus, failure to analyze the present, to extrapolate from it and predict the possible futures, will place us as a culture completely at the mercy of that future. Are we rational beings or not? Don't answer that! Just bear in mind that a visual image is not dependent on rationality; it is pure sensation.

How, then, does one produce a good illustration? Believe it or not, a thorough knowledge of the story to be illustrated is of paramount importance. Just getting a few paragraphs from an editor will not give the artist the overall feeling, the details, or the pure enjoyment of reading the story, the last of which is essential for real contact with the reader. Anything less is mere page decoration, however beautifully done, and not true illustration.

Just a few words about the "cre-

ation" of a drawing or painting: The picture one "creates" will usually not be good. The *good* picture is the one you *realize*—the artist is the *means* of its manifestation. But "creating" is the term we're stuck with although it's an unfortunate misnomer.

There are several ways one can approach doing a picture:

A. *No idea at all.*

1. Set up a general overall composition—fill in the details to suit the composition.
2. Assemble a mass of details and juggle them mentally until they form a satisfactory composition.

B. *Start with an idea.*

1. Compose the picture on a visual-emotive basis, determine what details are required to convey the desired effect.
2. Assemble all available relevant data (details and background information). Decide how to best organize the material into a composition with satisfying aesthetic results.

I use whatever method suits the present assignment, as well as the state of my liver at the moment. Whichever way you go, just don't you dare be wishy-washy about it. To illustrate is to be deliberate: you pick your subject and method, and you stick with them, right or wrong, for that job.

After you've digested the story, you try to appeal to what your observer already "knows"—especially at his unconscious level. For example, the reader "knows" that ghosts and vampires *don't* cast shadows. Objects do.

OK. Let an object (say, a chair) cast a shadow, appropriate to the lighting of the scene, right where the ghost's shadow ought to be. The reader may not even *see* it, consciously—but his subconscious notes and records "*ghost*."

This, of course, is a matter of judgment. Judgment, good or bad, is not necessarily an aesthetic problem. Bad judgment may not affect the quality of a painting *qua* painting, while ruining its effect completely as an illustration. Authenticity, good drawing, "rightness" of whatever sort *does* count. A techie snarls: "Those wings will never lift that weight." A carpenter observes that your hinges will pop the first time your dungeon door is opened, etc. To these readers all the work you've put into creating your illusion is shot. For example:

If you are doing a painting in which your center of interest is a horseman, there is good reason to make the horse anatomically correct. You adapt your *design* to make the effect you want possible. Note: correctness in that case does not imply that you should not exaggerate as required to convey character and motion. Just remember that the objective is to produce, let us say, "a fighting horse," not "a horse with funny legs"!

If your horse is a secondary, or minor element in the picture, you can feel free to shrink his head, stretch his neck, or move his legs into impossible positions in any way that suits the mood or composition. Note well, however, that if you do it correctly (i.e., if your judgment is right and the distortion *works*), nobody will notice it anyway. The ob-



jective in this case is to establish a situation but not to divert the observer's attention from the action or the message of the picture.

Another important consideration is that your drawing or painting, while communicating the ideas of the author, should also stimulate the potential reader's curiosity to the point that he or she feels compelled to buy the book or magazine and read it. As a reader, you are no doubt well aware of that phenomenon. How many times have you picked a book out of the rack because the cover was interesting—and cursed because it had no connection with the story? Well . . . maybe that's why so many of us prefer magazines: at least the odds are with us that there will be some connection between cover art and content.

Personally, I find illustration to be thoroughly satisfying and emotionally rewarding. Now don't get me wrong: I enjoy fine art as much as the next guy. It's not illustration, but it is of tremendous value in its view of the world. However, I consider easel painting to be fine for persons of independent means, or for those who enjoy a diet of dry bread and sour wine in their garrett. But have you *priced* a garrett lately? In any case, for me, the real enjoyment as

an artist is in interpreting and bringing into visual reality the writer's own concept in such a way as to satisfy the author and enhance the readers' enjoyment. It's also nice to please the editor and the art director too, if you expect to be paid. And I'll admit that I do occasionally succumb to temptation and do a drawing or painting or two out of sheer self-indulgence. But not often. I just don't have time to take out from the *important* work—ILLUSTRATION (in spite of the admitted attraction of those girlie pictures which I never have time to paint anymore—sigh!).

Hey, Laura, are you free to pose for a few minutes? What? . . . Deadline? . . . Well stop wasting time and get back to the drawing board! . . . Oh, well, maybe next year . . .

In addition to a hectic studio schedule, much of my time nowadays is spent inducing potential illustrators to come out of the wainscoting and start chewing on something substantial. Like the four thousand dollar annual prize from the L. Ron Hubbard Illustrators of the Future contest. There is, after all, only one indispensable requirement for good illustration in our books and magazines. To wit: illustrators. Tongue-tied storytellers who can't type. ■

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F. Alexander Brejcha

PRELIMINARY DATA

There's one kind of experiment
that imposes special requirements
on the experimenters.
But will they understand that?

Scent strong . . . female in heat. Nose down, follow trail. Stop! Strange, dangerous smells in background. No! Female scent too strong. Must mate. Pressure mounting, pain. Sight blurs. Her scent trail clear, follow.

Trees gone, open meadow. Scan the grassy field. Sun overhead bakes down, hot air still, no movement. Scent trail weaker under sun. Wind shifts, scent *strong* from hill on other side.

Carefully move closer, dark opening. Cave in hill. Enter . . . sweet season powerful . . . Stop! Ground different: hard, cold. Strange smells, dangerous smells again, strong. Turn quickly but . . .

Loud slamming sound behind. Darkness, trapped. Air thick . . . Blackness . . .

Wake up in light cave. Small suns above shine, but with cold light. Look around. Smooth walls on three sides, below and above. On fourth side, wall

of branches blocks entrance and divides daylight from outside into hard stripes across ground. Hard, straight branches that do not move. Push, harder, slippery like wet rocks in stream. Fight. Claws, teeth hurt and do not mark branches. Pain. Turn to walls on sides. Different. Marks, but not much. Roar challenge, but no answer, only echo from all around. Trapped in cave. Not dark, no sun. Light on other side of branches stronger. Female gone. Pressure less. Head hurts.

Water. Scent water. Over by wall in back of cave, narrow stream. Cold, fresh. Drink.

Bright flashes of light from sides. Strange sounds.

Food appears from hole in wall. Hunger explodes, triggered by fresh fish on floor: Fruit, berries. Eat. Full, sleep.

Wake, same cave, same light. No escape. Explore. Urinate in corner, mark territory. Push branches. Want out.

Sleep again. Lightly. Wake. Sleep.

Light comes and goes, food comes out of wall. Smell of feces and urine grows in corner.

Sounds in wall. Female scent returns, strong, near. New hole in wall. Small, nose just fits—

Banging sound from behind, sharp pain on rear flank . . . turn to see wall of branches close, glimpse of tall figure vanishing. Wall of branches solid again. Push against them, but branches strong. Scent from behind pulls, turn . . . legs weak, vision blurring . . . darkness, falling . . .

Wake up. Stiffness and raging hunger fight for attention, but hunger wins as the smell of food pulls. Fruit, fish are devoured. Fresh water still flows, drink. Cave clean, but, trace of scent mark remains. Same cave.

Light beyond wall of branches beckons. Move closer, chew, taste, smell. Not branches. Dead things like walls. Straight, smooth, hard. Push but they do not move. Shake branches—

Paws different!

Sit on ground and look at paws. Claws gone! Toes longer. Try moving toes and each toe can move on its own. Paws hurt. And so does head. But can pick up pieces of food and hold them for better control. Food comes from hole in wall. Watch it now. Pushed out by a branch like those blocking the cave entrance, but smaller. Then hole closes.

Little suns above go dark and bright with light outside. Day and night.

Watch hole in wall. Where does food come from? Every day food is pushed out and branch is almost outside hole

before pulling back as wall closes. . . .

Grab branch, pull. Paws hold much better and branch breaks off. Hole tries to close, stick branch in to block it—wall can not move. Strange sound, sharp smell in air and wall stops moving.

Sound from wall of branches. Turn to see tall figure on other side, outlined by strong light from behind. It is holding a long branch. Soft, spitting sound and sharp pain again. On shoulder, small red flower blooms. Attack, anger! Creature moves back, fear—strong smell of fear as it disappears . . . world blurs and fades.

Wake up again. Body sore, in pain. Head hurts. Still in cave. Sit up to groom. Body slimmer, easier to reach to groom, but raging hunger invades as hole in ceiling slides open and food drops down onto floor.

Light comes and goes.

Explore branches. Opened before. Reach through, but branches don't move. Hole in ceiling? Stand, wait for food to drop. Too high to reach. But easier to stand.

Sit, wait. Feel strange. Body tickles. Like bugs crawling over it, but inside. Eyes blur and then clear and ears buzz.

Sound from outside. The creature with the pain-branch is back and sticks it through the bars to spit. Again, the red flower hits a flank and pain floods up. The branch threw the flower. It means sleep. . . .

New cave, inside larger cave. Clear and light. Branches all around from

ground up. Outside, in larger cave, strange rocks that are not rocks flash with tiny lights like fireflies. Food hangs from above. Reach up and grab it. Easy to stand and reach. Down on ground on all four paws feels wrong. Stand again. Feels good, natural. See water in the hollow of a shiny rock, up high on wall. Just right to reach when standing. Drink, cool fresh. Vision sharp, clear. Colors brighter. Many new colors and strange smells.

The wall in the larger cave opens and two strange figures enter, walking on their hind legs in challenge. One tall, one short. They have flat, ugly and naked faces with only fur on top of the heads. The large one has short, dark fur and is covered with something soft that is not fur. It is the color of a storm sky. The small creature has light fur that hangs down along its back, and its covering is the color of snow. It is very frail looking, but has a strong chest. Naked legs stick out from the bottom half of the covering.

They approach the branches and make strange noises back and forth as they point in. They smell bad.

Shaking and branches prove they are as strong as those in the small cave. The tall figure moves back. Smell of fear. But the smaller one moves closer and stares in.

Maybe not a challenge?

Head hurts from the strange thoughts.

The small one reaches for a piece of fruit on a rock outside and holds it out, stretching in past the branches.

Food, offered . . . ?

It stares in, unafraid, fruit just inside

the branches, close enough to reach out and attack. But why? There is no threat.

I . . . reach slowly for the fruit. Take it carefully, and eat it. The small one does not move, even though a scent of fear rises momentarily.

Food offered to . . . me . . . I am? What am I? *Who* am I?

Noises outside the cage distract me from this new idea. A third creature—looking like the tall one, but with dark skin and even darker fur on its head and face—has entered the room, and the two tall ones draw the small one away from the cage and chatter at it.

My head is hurting as I look at the three waving their paws around at each other, sometimes at me. They are communicating. About me.

Why am . . . I . . . here? I am me. Captive. "Me." I study my paws and flex my toes. I held the fruit easily. The longer toes give more control. When I shook the surrounding branches, my toes allowed a better grip. They let me hold the fruit and break the branch in the first small cave. . . . What else?

And what am I now? Not what I was. I am different. I do not remember wondering like this. I do not remember . . . much at all.

Vague flashes of streams, dark forests . . . fade with pain.

I see a shiny surface against one wall outside in the larger cave, and move closer to the wall of branches farthest from my noisy captors. I can see myself! Like a still lake, the hanging surface reflects my image and I study it. My face is the same. Long, finely furred muzzle, healthy moist nose and clear

eyes. But my body is different, somehow—more slender. Straighter legs and longer toes on my front paws make me look . . . more like the creatures surrounding my imprisoning cave, just larger.

I turn to look at them in surprise, only to find that they are studying me and pointing at me, eyes open.

I point back. Then to myself. I drop to all fours briefly, and then stand up. Will they understand that I am asking them what happened to me? Why I look so different?

They stare at each other and one runs to fetch a long branch like I had seen before. I rub my side, remembering the sudden pain. They mean to make me sleep again! I back away into the far corner of the cage, trying to find some way to shield myself. I remember the painful red flower the branch throws.

But outside, the small one who had offered me the fruit grabs the branch and throws it away, chattering even louder than the others as it pushes them back away from me. It walks over to the one wall and opens a large white rock with a light inside, and takes out something shiny and brings it towards me.

I stay in the corner.

It is . . . speaking. It is trying to communicate with me. I can not understand, but the sounds are soft, soothing. It moves closer, and then reaches in to hold the object in its hand over my water. More water pours out! The thing is hollow. Then the small . . . being, moves back and points to the water. It is offering the water to me like it did

the fruit.

I move towards it slowly, watching the two taller beings outside. But they are silent and still; waiting?

I bend over the water and lap, carefully looking out over the watchers. Nothing. The water has a different taste to it—deliciously sweet—and I drink deeply, forgetting the others until the bowl is nearly empty. Then I straighten and back away, eyeing the suddenly alert strangers who are watching me. I have a mental image of the scavengers who circle a leftover kill. I stare back.

They blur. My legs get weak and I fall. They tricked me! The world fades into blackness again.

I can not see or move. Something is covering my eyes, and my legs are all held in place. The sounds of my captors' strange speech surround me. Two of them. As I listen, I realize that I understand some of what they are saying. Most is only collections of noises, but some of it makes sense. I realize they are talking about me, even if I can't grasp just what they are saying. . . .

"Is it safe?" A deep voice. "I mean, it can't get loose, can—"

"He, damn it!" A higher pitched voice, accompanied by a scent of . . . not fear, but anger? It overlays a pleasant flowery scent like the sprawling tiny yellow blossoms in a spring-time meadow. It is the small one who had fed me, protecting me somehow again as . . . she . . . did when the taller ones were going to use the spitting branch on me . . . the tranquilizer gun. A mental image flashes in my head. I

don't understand it fully, but the female did not like it.

It is strange, but somehow I know them. As if in a dream. The deep voice belongs to the first tall creature, a male, and the higher voice to the light furred one, who is female. An image—a memory?—flashes through my mind. Of the two standing over me, talking and showing me images of objects that seemed real, but when touched, were cold and flat.

The scrap of memory fades and I hear the female speak.

"Stop talking about him as if he was an object. He is still a male . . . even if you talked me into neutering him the last time under."

"That was for his own good," the male defends itself. "The instinctive arousal reactions could get in the way."

"Maybe, Greg, but I feel bad about that." I sense a soft touch on my foreleg—"arm," a part of my mind supplies. I suddenly realize what they are talking about and lie there in numb shock, unable to move as they keep talking.

"It can always be undone," "Greg" is arguing. "Nothing is permanent, here. It's incredible! Microscopic machines that can go inside the body to heal—or to change—it's like something out of a science fiction book. But it works, and you've done wonders here. Even I have to admit it. The conversion is nearly complete and it took less than three weeks. Even . . . his . . . programming is partially complete—"

"After a week under on drugs while semi-conscious! I wish we would have

had time to teach him normally."

"You made the only decision you were able to. The presentation is less than two weeks away, now. But, we're ahead of schedule and you'll have some time to teach him 'normally.' At this point it will be easy since he should have a basic vocabulary after our programming."

Shock, and counter-shock. I have been mutilated, but I can be healed. But anger grows in me and I try moving again, fighting the bonds with my whole body, but they are too tight. I try to roar a challenge, but no sound emerges.

"Look out! He's awake!" Greg smells afraid. He should be!

I sense Cynthia leaning close. "Damn, the anesthesia wore off quick!"

Light floods my eyes as they are freed and I look up at her. She is studying me with narrowed eyes, but for some reason I am unable to keep my fangs bared as she speaks, softly.

"I think the housekeeping nanites in his system are differentiating and treating the anesthesia as a toxin. We're going to have to reprogram them before we put him under again to finish his voice-box. Are you all right?" She bends over me and stares into my eyes, shining a small light into one after the other. Her strong flower scent is overwhelming.

Greg touches her arm. "He can't answer you and I'm not even sure he can even understand you yet. He needs time to assimilate everything."

"I'll bet he can understand. Look at his face. He's angry, and scared too,

I'm sure of it!" Cynthia pulls free from Greg and touches my arm again.

"It's all right. We won't hurt you. We're going to take care of you." Her voice is the same soft, soothing one she used when she offered the water and I am suspicious.

She turns to Greg. "He understands me fine. I know what I'm doing. The cerebellar differentiation and expansion went well and interconnectivity was increased substantially. Theoretically, he should be able to reach an I.Q. in the eighty to one hundred range."

"He's still only a bloody bear." Greg is fortunate I am tied down as he steps closer. "A Kodiak bear, not a man. Nanotechnology can only do so much. We should have stuck to the apes like Jamieson and the others are doing. At least they're more predictable."

"And bo-o-ring." Cynthia shakes her head. "We need to be different, daring, and catch the review committee's attention. Besides, I wanted a bear because they're stronger. Tristan's gravity is double Earth's and we need a stronger baseline. The apes are too small to bulk up enough to be useful. The bears are easier to modify—"

"Even with your brain work, they're not as smart—"

"So you say."

My eyes follow the exchange, only vaguely understanding that Cynthia is continuing to defend me, in her way. She leans back over me and stares me right in the eye.

"We'll show them! Jamieson's team is the only one anywhere as advanced as we are, and with the bears, we'll

blow their super chimps out of the water. We'll prove who's best suited for their bloody mining camp!" She grips my arm tightly and then relaxes, running her hand down my arm lightly, one finger tracing the muscles. The tip of her tongue traces her lips lightly.

"You'll show them. You will be the best. And not just with radioactive mining, but you'll make the best damn construction and operating crew that money can buy. After we show you off, they'll have to give me the funding to go on." She spins and heads off to the side, out of my sight. I hear her call out, "I'm going to make sure the training room is finished. We'll just have to put him under once more to finish the voice box."

Another figure moves into view. The other man from the larger lab where my last cage was housed. He stands over me, shaking his head as he holds a small clear tube with a shiny . . . needle in the end. He reaches down and slips the needle into my side. There is hardly any pain. Then he stands up and turns to Greg. "I don't know. I hope she's not too optimistic. I just found out that Jamieson has a lot of friends on the review board. I think she's right about bears being the best choice—that's why I've gone along with you—but what if the government feels more comfortable with Jamieson's approach and awards them the contract? What do you do with this thing then?" He nods in my direction.

Greg shrugs. "Oh . . . I don't know. He'll be of no use then. We'll think of something, I guess. Let the university ethics committee worry about it." ■

The Alternate View

INTERMITTENTS

G. Harry Stine

Although this column occasionally reports something new or different in science or technology, response from the readers indicates that the most popular subjects involve matters that scientists, engineers, and science reporters rarely talk about.

One of these subjects is the care and feeding of intermittents. And how to eliminate them, if possible. (It probably isn't. Read on.)

An intermittent can be generally defined as a non-predictable and often non-repeatable change, the cause of which is often impossible to find. The intermittent can either cause the device to quit completely or to continue operating in a non-useful mode.

Naturally, the sort of scientists who behave as if their lab coats were mightily inflated (read: stuffed shirts) will *never* discuss this, much less admit it, because Science Is Repeatable. They do not realize, of course, that this means that an experiment is repeatable if it fails the same way every time.

On the other hand, other types of scientists spend their entire careers dealing with events that cannot be forecast and are non-repeatable. Astronomers who specialize in meteors are among them. (Except meteorists do claim to be able to forecast the dates and radiant of ma-

yor meteor showers.)

Out in the Real World, the PBEs and PBTs (Poor Bloody Engineers and Poor Bloody Technicians) are forced to deal day after day with something that often passes as a swear word: intermittents.

Often when I wonder what I'm going to write about in the next column, something happens that triggers the subject. In this case, it was an intermittent.

Hear me out: In Phoenix in the summertime, automotive air conditioning is no longer a luxury. Before we had A/C, one drove across the deserts only at night because it was much too hot in the daytime. One didn't even drive to the grocery store in the time period between one hour after sunrise and one hour before sunset. Dear friend, when the outside temperature is 112° F and the interior temperature of a car can reach 140° F even with a white roof, you don't go much of anywhere, low humidity or not. Our Hispanic friends south of the border have the right idea; without A/C, you might as well find the coolest spot available and take a *siesta*. We Anglos have a different cultural outlook on work, so we applied technology and came up with air conditioning, a development that eliminated the need to take a *siesta*. That's too bad in some ways because a short nap after lunch shows some indication of postponing that biological intermittent known as a heart attack.

Fortunately, the AC in the car quit while driving home from a meeting at 9:00 P.M. The temperature was only 101° F. Survivable. I tackled the problem early the following morning when the temperature was only 95° F. I set up a floor fan to keep air moving in the car

while I probed around with a test light and a VOM.

If possible, I always get the repair manual or other documentation dealing with any device I own. That makes it easier to fix it . . . sometimes.

So I started right at the +12VDC electrical bus and began tracing through the wiring.

In the first place, I discovered that the circuit diagram in the documentation (repair manual) bore absolutely no resemblance to what was actually in the car. I had gotten the vehicle second-hand. Before I'd purchased it, someone had made Mod 1 and never recorded what had been done. Not to worry. Straight DC circuitry. *Nema problema!* I forged ahead.

Looked like a relay was stuck. So I pulled it. On the bench, it worked perfectly. I put it back in and hooked it up. Still no joy. Now something else was wrong. No current to the compressor clutch. I started tracing wires. No problem. I probed among the connectors and zoo of wires under the instrument panel. That in itself is a major task. It's an older car, and I can get behind the instrument panel without taking the rest of the car apart. It's possible to reach most of the equipment back there without hiring a long-armed midget with eyes on his fingertips. Modern vehicles aren't so maintenance-benign behind the panel.

Then the blower motor came to life all by itself.

Everything began working perfectly.

The intermittent was gone.

I couldn't get it to quit. I couldn't duplicate the failure mode. I couldn't duplicate *any* failure mode. I shook and

pulled on wire bundles. I shook connectors. I cycled switches. The vehicle just sat there perversely mocking me as the air conditioning system pumped 45° F air from the dash panel vents.

That should have cooled me off. Physically, it helped. But intellectually it was like interrupted sex.

There is almost *nothing* as frustrating to an engineer or a technician as an intermittent. It's even worse if the damned intermittent goes away and you have *no idea* what caused it or what might bring the trouble back. Or when.

In product development, the emergence of an intermittent can cause wonderful new gadgets or ideas to be trashed. Sometimes, an intermittent, glitch, bug, or software problem can be temporarily ignored. When this happens, the rationale is simple: Let the customer find out if it's really an intermittent or a major goof in the design. If the intermittent isn't deadly, this may be the only way to attack the problem. Years may go by before a trouble report gets back to the plant. The intermittent may never happen again. You never know. You tosses them dice and you places your bets, folks. Hopefully, the development engineering staff and the quality control people will retire or go elsewhere first. Or the gadget will exceed its design life and die a normal death.

Of course, the trouble reports that do filter back report on intermittents that never occurred during development and testing at all.

Somebody will immediately opine, "Murphy's Law." But it isn't. At least not pure, unadulterated Murphy's Law. Actually, it might be the nastiest corol-

lary of Murphy's Law.

I've come to the reluctant conclusion that there isn't a whole hell of a lot that can be done about intermittents except to try to make them non-intermittents when they happen. Otherwise, they must be ignored if they can't be fixed. And you're never sure whether or not they've been fixed anyway. The Universe is so full of wild and wacky variables that it's almost impossible to get a handle on all of them. We are beginning to discover this as we start to tackle the perceived problems with the environment on a small planet.

As our technology gets higher and higher and we begin dealing with smaller and smaller entities, perhaps quantum mechanics does indeed become the dominant factor. In which case, I'd like to hope that my colleague, Dr. John Cramer, can make a grand and historic contribution to technology by showing all of us how quantum mechanics can make intermittents more predictable and more fixable.

We do seem to make some progress now and then. Some intermittents can be duplicated and fixed by kicking the damned gadget at the right place with just the right amount of foot power. Others can be located by judiciously spraying a little non-ozone-destroying refrigerant here and there to learn if the intermittent is caused by a heating problem. We've learned that sometimes the whole thing can be cured by replacing the fuse; if the second fuse blows, you've got a real problem. Sometimes the solid-state circuitry protects the fuse by blowing first. . . .

It's no better in the chemical technologies, either; fireworks are the worst

intermittently workable devices, and rocket motors are only a little bit better. Only a few of the Fourth of July fireworks injuries are due to stupidity or inebriation on the part of users, and there isn't a rocket engineer or model rocketeer who hasn't had a rocket motor go bang when it should have gone whoosh in spite of the best quality control procedures.

As for weather, forget it. Climate is what we want, but weather is what we get. One of the most powerful of German swear words is simply, "*Ach! Wetter!*"

Some intermittents are indeed predictable (like the experiment that fails every time). Washing the car will *not* cause rain to fall on it within 24 hours in Arizona. However, the proper beating of tom-toms *will* cause a total solar eclipse to end. (I have incontrovertible proof that both of those experiments are 100% repeatable.)

I once had the joy and privilege of running an industrial research laboratory for five years. One day, the sign in front of the building bore a new appellation: "Corporate Applied White Magic Laboratory." (Gee, I wonder who did that. . . .)

One of the great failures of the philosophy of materialism has been its presumptuous first principle: "We know everything there is to know about the universe." Anyone who's had to chase an intermittent in any device knows this principle isn't true.

I would like to voice a plea to the mathematicians and physicists out there amongst the readership. Please try to apply quantum mechanics or catastrophe theory or fractals or fuzzy logic to

one of the biggest problems inherent in all our technology, high and low: intermittents.

Of course, you must realize that when you do this you will also be laying yourselves wide open to the various intermittents that will surface in your applica-

tions of math and physics to the problem of intermittents elsewhere.

Remember the old doggerel about fleas and lesser fleas?

And, please, don't get too serious about it or you will likely end up being a social intermittent yourself. ■

CLARION '92

The 25th Clarion Science Fiction and Fantasy Writers' Workshop will be held at Michigan State University from June 28 to August 8, 1992.

Clarion is the oldest and most successful writing workshop in the science fiction and fantasy field. Over a third of its graduates have published since leaving Clarion. They include Ed Bryant, Lucius Shepard, George Alec Effinger, Octavia Butler, Kim Stanley Robinson, Vonda McIntyre, and Spider Robinson.

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L. A. Taylor

CHANGE OF LIFE

You've read lots of stories about time travelers tampering with the past—but there's another possibility you probably haven't thought of!

When she fell asleep, Maggie was eight years old. When she woke up, she was fifty-five.

The first odd thing she noticed was that the bedroom ceiling was white instead of pale blue, and that the big glow-in-the-dark stars and comets and moon that had shone down on her for as many nights as she could remember were gone.

That's funny, she thought.

Then, too, when she started to pull up her knees, she didn't feel right. She felt . . . *different*. Kind of . . . heavy? As she thought about this her heart began beating faster. She was careful not to move: lying still wasn't so bad.

Maggie glanced cautiously around the rest of the room. Not hers. The bed she lay in was not her walnut bed with the pineapples carved on the posts. The quilt with the green and white pinwheel pattern was not folded over the foot rail. This bed had no foot rail. Not much of a headboard, either, and it was big, like

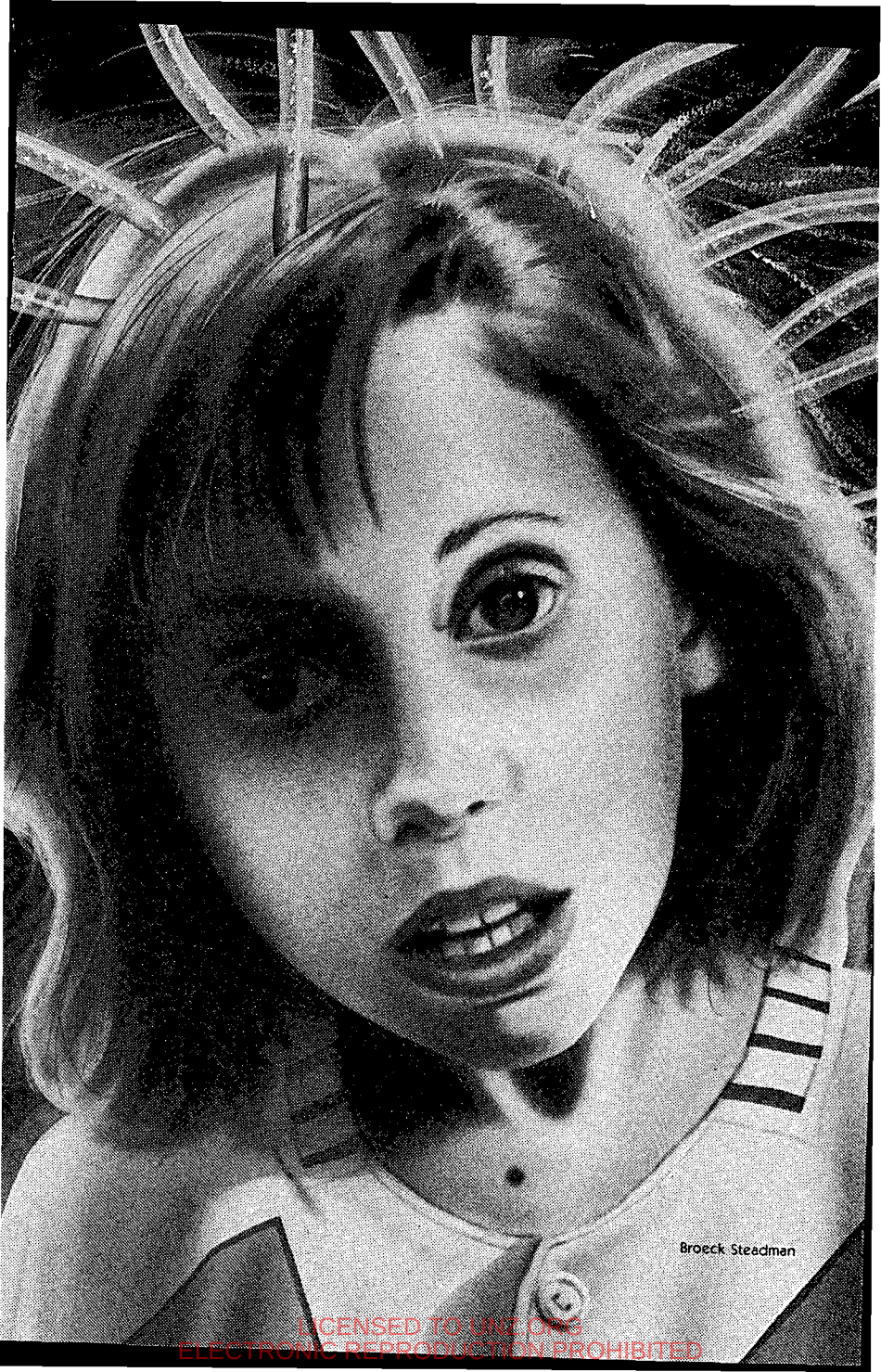
a grown-up's bed, or like the bed her twin cousins shared.

What's going on? she wondered.

A strange man came quietly into the room. He looked a little like her grandfather: about as tall, with dark hair going thin on top like his, and a little bit of extra weight around his middle, like the "spare tire" her grandfather complained about all the time, only not as much of one. Maggie watched the man walk around the end of the bed, his attention on the cup he was carrying. When he saw her looking at him, he smiled.

"Hi," he said. "You're awake. Here's your coffee." He said it casually, as if he brought coffee to her every morning.

She was a cautious, almost secretive child, shy, with a bunch of noisy uncles and aunts and cousins who sneered joyously at every mistake, every mis-spoken word. Mom said that was because the teachers said she was smart and they



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were jealous, and she wasn't to pay any attention. But Maggie loved those aunts and uncles and their laughter hurt. Long ago she had learned that when you know nothing, you do not ask questions. First you observe as much as you can, so that when you do ask a question, it is as specific and sensible as you can make it. That way she could avoid the worst of the teasing. So now she just smiled at the man and sat up in the bed.

Good *golly* gosh, but that felt funny! Maggie looked down at herself and saw a grown-up body in a blue cotton nightgown.

"Are you OK?" the man asked. "You look a little flushed."

Here's a way to gain time, she saw. "I don't feel so good," she said slowly. Her voice was lower than she expected, lower and more resonant.

The man had sat on the edge of the bed, after setting the cup on the table beside her. Now he clasped her knee with one hand, leaned forward and put a kiss on her cheek, sat back and smiled. "You want to go back to sleep?"

Maggie shook her head.

"I'll get you the newspaper, then." He paused by the window on his way out of the room and peeped through the blinds. "Ah, Maggie, it's a gorgeous morning! I wish I didn't have to go to work, but I'm running twenty minutes late as it is."

So he knew her name. Or her name was the same as the name of this body. Maggie tried to think what a grown-up might say, but she couldn't. The man flashed her a smile, to which she responded with a small one of her own, and left the room.

While he was away, she studied these

hands she had wakened to. They were well on their way to being old-lady hands, like her Gramma Jeannine's, with blue veins on the backs and wrinkly skin over the knuckles. But they were *her* hands, Maggie's: the veins were the same shapes as always, and on the outer edge of the left hand was the scar left by a cut from a broken glass just last year, only white instead of pink. Even the dots of the stitches showed silvery against her skin. The u-shaped scar on her right thumb from using the potato peeler left-handed was there, her fingernails were the same flattened shapes, and her wrist bones stuck out, same as always. On her left hand she was wearing a narrow gold band and a matching gold ring with a pretty diamond in it. A wedding ring and an engagement ring. Was the strange man her husband?

A funny shuddery feeling went through her at the thought. She picked up the cup of coffee.

Maggie had had coffee before, but that had been almost all milk, with a couple of tablespoons of her Mom's strong coffee for flavor. This was the other way around, a whole cup of coffee with a couple of tablespoons of milk to lighten it—bitter, but not unpleasant. She had the feeling that her tongue knew the taste better than she did.

The man came back with a newspaper. He said something again about running late, sat on the other side of the bed, leaned across and kissed her *right on the mouth*, and stood up. "I'll call you later," he said. Maggie smiled uncertainly at him. "Have a good day."

What a strange thing to say! "Thank you," Maggie said. "You have a good

day, too." The man glanced sharply at her, hesitated, then smiled and departed. When she heard a door close with the special extra click of a lock, Maggie unfolded the newspaper he had left on the bed.

The headline was about the Persian Gulf. Maggie knew where to find the Persian Gulf on the globe in the school library: the last time Daddy came home on leave, he'd been through the Suez Canal. He liked the weather over there, he said. Hot. Daddy had told a story about the crew on his ship, how they shaved off their hair and put oil on their heads to keep cool, and after they were on their way back across the cold Atlantic one man's hair grew in a different color than it had been before. Maggie hadn't thought that was funny, but her aunts and uncles, even Mom, had laughed and laughed—

She thought to look at the date on the newspaper. The year made her jaw drop, and she turned to an inside page to see if it was the same. Yes. Nineteen-ninety! A sick, piercing disappointment filled her chest as Maggie realized that she had missed seeing Halley's Comet, after all. Fifty-one had seemed so *old*, just yesterday. She hadn't been sure she would live that long, long enough to see the Comet. And here she was even older! But how? Why?

She folded her legs under her and spread the newspaper out. Here was a map, but they'd gotten it all wrong. Where Palestine should be they had a name out of the Bible, Israel, and they'd left out the *Trans* in Trans-Jordan. Or had the countries changed? Wouldn't that be funny? Like the German map her second-grade teacher had shown the

class last June, with all the countries Hitler had taken over colored pink like Germany.

For the next hour, Maggie studied the front section of the newspaper with all of her attention. When she was done, she knew that the world had changed a great deal since 1943. But what had happened to her?

One thing, she had to find the bathroom.

At least toilets were still the same, she discovered with relief. She used the one she found, somewhat guiltily drying her hands on the yellow towel beside the sink afterwards. But she had to wash them, didn't she?

On the wall of the hallway across from the bathroom door were four big picture frames, each with a lot of little photos in it. All of the photos were in color, though they looked like ordinary snapshots otherwise. Maggie filed this interesting novelty away with the hundred or so others she had gleaned this morning, and examined the pictures.

She didn't know these people. At least . . .

In a lower corner of the second frame from the left, she recognized the back door of her house—the house she *should* be waking up in. Standing in the doorway was a teenaged boy, one with a family resemblance to herself. She frowned, putting facts together. Possibly he was her little brother? In other pictures, she saw the same boy getting older—at the wheel of a shiny car, holding a baby, sitting beside some machine. In the second frame from the right, she found a picture of Grandpa.

Looking a little more closely, she felt her pleasure fade. It wasn't Grandpa,

just somebody who looked a whole lot like him, but with less hair and a little fatter. He was sitting at a picnic table with ocean behind him and he was smoking a cigarette. Grandpa didn't smoke.

Maggie stared at the image for several minutes before deciding that she was looking at her father.

The strange man who had given her coffee was in a few pictures, too. Sometimes he had hair and sometimes he didn't. Maggie had been twisting the diamond ring around her finger as she studied the pictures, and now it occurred to her that if she was married she might have children. Several children appeared in the photos. One baby was on the lap of a young woman who looked a lot like Maggie herself. She thought that one might be hers. But there were at least seven other children in the photos, all of them obviously related to the Thornleys, and no way to tell who they belonged to.

Meanwhile, a clock somewhere in the house had chimed ten. She should be getting dressed. Maggie went hunting through the drawers in the long, low dresser in the bedroom she had awakened in and found some clothes that looked almost like kids' clothes, knit shirts in bright colors and blue dungarees. Would they be the man's? But the label in the back of the neck of one of the shirts said *M 10-12*, and that was a woman's size. She put it on, then remembered that if she was grown-up she should be wearing a brassiere. She found one in another drawer of the same dresser, rolled up next to some rolled-up panties just the way her Mom put things into drawers. She put the under-

wear on and felt better about wearing the other clothes. They seemed to fit.

I should have talked to the man, Maggie thought as she made the bed. Maybe he wouldn't have laughed. I should have told him something is wrong. Because now I don't know what to do.

She walked into the hall, saw an archway near the other end of it, and went through that. This house didn't have any stairs: she was in the dining room. The dining room table was her grandmother's. But this wasn't her grandmother's house! Panicky, Maggie ran into the living room. Better. A pretty Oriental rug covered the floor, one she had never seen before. Nice chairs and a couch, all sort of plain, and plain painted walls. A mirror hung over a fireplace at the other end of the room.

In the bathroom, Maggie had lowered her gaze while she washed her hands. Now she stared at this mirror. In it she saw the top of the window in the wall opposite her, green leaves through Venetian blinds and blue drapes. Taking a deep breath, she crossed the room and looked at her own reflection.

Her face, but not her face. The eyes were the same, but more bloodshot, and her features were somehow more defined. A few lines crossed her forehead. Her hair was still short and dark, but there were grey hairs, too, even more than her Mom had, and the mole on her cheek was bigger than it used to be and a couple of hairs grew out of it.

Had she been older when she went to sleep that long-ago night, she might have cried, but as yet Maggie hadn't quite taken in the idea of aging and most of its implications had not yet struck her. Inside, she was still an eight-year-

old with a curiosity bump bigger than was good for her, as her Grandpa often told her. So she frowned at the frowning face in the mirror, filed away the appearance as a simple fact, and went to look for something to eat.

The kitchen had been made bigger at some time: she noticed the boxed-in beam that marked where the outside wall had once been, cutting the ceiling in two. That thing on that counter must be a mi-cro-wave like the ones in the newspaper ads. Maggie examined the controls, but they told her nothing about what the mi-cro-wave might be supposed to do. It didn't look at all like a radio. She decided to leave it alone. The big square box must be the refrigerator. It couldn't hurt to open that.

Inside she found eggs, but no bacon; butter, milk, and some pears. Poking through drawers and cabinets, she at last found a frying pan. The stove gave her a little trouble. The pilot light seemed to have gone out, and she couldn't find any matches. But when she accidentally twisted the knob the wrong way to turn the gas off, the stove snapped at her and the burner lit.

Maggie turned it off. She lifted up the top of the stove, twisted the knob, watched sparks snap and a little flame come on, then the whole burner catch the flame. *Clever.* She put the stove back together and cooked some eggs for her breakfast. She felt a little guilty, eating these people's food without asking permission . . . but it was hers, too, she reminded herself while washing the dishes, or she wouldn't have waked up in that bed and the man wouldn't have been so unsurprised to see her.

Now what should she do?

I'll write down that dream I had last night, she decided. Something about that dream was important, and she didn't want to forget it.

In an alcove off the living room was a little desk, like her Aunt Susan's . . . no, it was her *Aunt Susan's desk!* For a reason she couldn't put her finger on, Maggie found this deeply disturbing. She gave herself a little shake and opened the lid to look for paper and something to write with. A pad of lined paper was tucked into the space under the pigeonholes, just what she wanted. A thing that looked like a fountain pen on the outside had a peculiar kind of point on the inside, but it worked, so Maggie sat down and began writing:

Last night I had a funny dream. It was about the lady who did all those tests. First I better write about the tests. My new teacher, Miss Coble, recommended me for taking the tests. They are from the Institute for the Study of the Intelligence of Man, in New York City. I said I am not a man but Miss Coble said that is alright they don't mean just men they mean everybody. So Miss Brennan came to school to give me the tests. I had to go down to the cafeteria (nobody was eating because it wasn't time). Miss Brennan had lots of tests and they were kind of fun but a little bit silly, like repeating numbers after her and problems anybody could see how to do and a long long long list of words. I was supposed to tell her what they meant. She kept raising her eyebrows each time she said a word and I told her. She looked silly, but I was careful not to laugh. Then it was lunch

time but I wasn't done yet.

After lunch, the first thing Miss Brennan asked me to do was draw a picture of a man. She said make it the best you can, so I did. She got bored waiting for me to get finished, but when you draw a sleeve folded over a bent elbow it takes time to get the herringbone pattern just right around the folds. Also she told me I didn't have to bother to put the holes in the curly pattern on the toes of his shoes but I did anyway. Then it was time to go home.

That was Monday. Tuesday I did more tests, and yesterday she came and said I did such a good job on all of the tests that she wanted me to take one more. That was all about what did I think about the world. Hitler and Hirohito and Mussolini, but I told her now that we have invaded Cicely Mussolini won't last long.

Here Maggie stopped writing. "Cicely" was how the plant, sweet cicely, was spelled—she was sure of that—but it didn't look right with a capital C. After a few seconds she crossed it out, wrote "Sicily," nodded to herself, and went on.

After she asked a whole lot of questions about everything I ever even thought about, Miss Brennan took out a little flashlight. She said to look at the light until I got sleepy. I asked is this another test and she said yes, the most important one of all, so I cooperated like Mom told me I should and I went to sleep.

Now about the dream. (This wasn't in school because Miss Brennan woke me up before I had any dreams there.) It seemed like I had been asleep for awhile

and I woke up because the door of my room opened. I couldn't see any night light in the hall, so it couldn't be my Mom looking in on me because she always puts the night light on. But I felt like somebody was standing in the doorway and looking.

I didn't get up. I didn't ask who was there, because I thought "I must be dreaming" and it doesn't make any sense to talk to a dream. But pretty soon somebody walked across the room and sat on my bed.

"Are you awake, Margaret?" she asked.

"Yes," I said.

"Oh, good. I'm Miss Brennan. You remember me, don't you?"

"Sure," I said. I didn't say what a stupid question it was because that would not be polite but it was stupid. How would I forget her in one afternoon, when I had spent the last three days down in the cafeteria getting tested with her right across the table?

"I looked at your tests," she said. "You did very, very well. Better than anybody yet."

"Oh," I said. I felt pretty good. I like tests.

"Now, there's a little thing I'd like to ask you to do. It's something only a very, very smart eight-year-old girl can do. So you see why I'm asking you." She was quiet while I said Mm-hmm. Then she said, "Oh, the rashness of radishes." So I said, "Ravishing," and then she said, "Very good, Margaret. Now, listen carefully. I want you to come with me, just for a little while, for what I have to do. It won't take very long."

So I got out of bed and Miss Brennan

found my bathrobe and slippers and we went downstairs and out the front door very quietly so we wouldn't wake anybody up. A panel truck was parked in front of my house. I said I ought to tell my mother before I went anywhere, so Miss Brennan let me write a note and she made me wait by the truck while she took it back to the house to put on the kitchen table. Then we got into the back of the truck. They had a lot of funny-looking stuff there, kind of like Uncle George's radio stuff, only I didn't see any particular piece of equipment I could recognize, like earphones or coils or vacuum tubes. Miss Brennan said, "Now, Margaret, I'm just going to borrow your body for a little while. This won't hurt a bit," and she put a little tin hat on my head. Little wires came out of it. She put them into my skin all over, only it didn't hurt, just like she said. Then I went to sleep.

This morning I woke up, but it wasn't the next morning at all. She said a little while, but this is 1990 and that was 1943, so it has been 47 years. I don't think that's fair.

Maggie blinked. Two tears slid out of her eyes and down her cheeks. She wiped them away on the back of her wrist, put the cap on the pen and the pen back in the drawer where she had found it, and put all the paper she had written on into the center drawer of the desk.

Maybe this was another dream, but Maggie didn't think so. And she was beginning to think the middle of the night encounter with Miss Brennan was no dream, either.

* * *

Maggie spent the rest of the morning and early afternoon rummaging about in this house. Occasionally an object seemed to bring out a faint resonance, as if a memory were waiting to be recalled, but she couldn't make anything come. Could she have sleepwalked through most of her life? But in that case how come she could remember everything up to the beginning of third grade, and nothing afterwards?

In the back of a big closet Maggie found a few things she knew well: a book of famous paintings, the pages yellowed and the binding worn, although she remembered it as fresh and new; her best doll, Sallijane; a fancy flowerpot that used to have an aspidistra growing in it, in her grandmother's living room; a portrait of her great-grandfather that only yesterday had been hanging at the bottom of the stairs in her own house. Someone had not taken very good care of Sallijane. Maggie tucked the doll into a careful hug and carried her to the bathroom to wash her face and comb her ratty hair.

In a room that had lots of books in it she discovered an encyclopaedia. Maggie had learned to read long before going to school. She had known how to use reference books for at least four years, and she certainly wasn't baby enough not to know about the index! Still, when she sat on the floor to look up sleepwalking, she could find nothing to explain why she should have been eight years old yesterday—what seemed like yesterday—and was now fifty-five. She looked up the Institute for the Study of the Intelligence of Man, too, as long as she was at it. Here she had a little more luck, but not much. The Institute

had been formed in 1934 to do "longitudinal studies" of human intelligence, by identifying very bright children and following them throughout their lives. Although a large amount of valuable data was believed to have been gathered on over 4,000 children, no findings had ever been published. The institute had been privately endowed, and closed in 1962.

Sighing, Maggie searched for a dictionary, found one, looked up "longitudinal" and "endowed," and felt unenlightened.

A little later a noise in the front hall closet startled her. After a moment, she figured it out: this was one of those houses with a mail-slot through the wall next to the door and what she had heard was the mail sliding into the closet. She fished it out and looked at it. The name on the envelopes was Frank Morgan. No, here was a letter addressed to Mr. and Mrs. Morgan. Maggie opened it quickly, before she could think too much about whether she ought to. The note inside was addressed to Maggie and Frank from someone named Joan. She didn't know anyone named Joan. Joan wanted Maggie and Frank to give their regards to Susan. She didn't know anyone named Susan, except her aunt.

She hoped Susan wasn't her daughter.

The nice man called to see how she was. Maggie told him she wasn't feeling well, but didn't think she needed a doctor. He seemed pleased when she told him about the letter from Joan, so she read it to him. When she hung up, Maggie still didn't know who Joan was, but the nice man *had* turned out to be

Frank: she'd called him that, and he hadn't protested.

While she was trying to decide whether and when she should try to cook dinner, the telephone rang. A woman asked who she was.

"Maggie," she said promptly.

"Ah, yes." The woman seemed to sigh. "Oh, the rashness of radishes," she exclaimed.

That's funny, Maggie thought. *That's the same thing Miss Brennan said in my dream. Why would she say that? It's dream-talk!*

"Oh, the rashness of radishes," the woman repeated.

"What?"

There was a sliding sound as a palm covered the telephone, and Maggie heard the woman say, "She doesn't respond. What should we do?" There was a brief silence, then the woman said, "Memory reconstruct? Isn't that . . . ?" The phone at the other end of the line clunked down on a table and the woman didn't come back for a long time. Tired of waiting, Maggie hung up.

The telephone rang again seconds later. "Maggie?" the same woman's voice said. "Stay right where you are, will you? There's been a little, er, problem, and you may need some help. Someone will come right away."

Maggie put the receiver down, her eyes narrowed in thought.

A car stopped in front of the house. Squinting, Maggie made out the lettering on the door: Human Potential Association. Like the Institute for the Study of the Intelligence of Man?

She stood back from the front win-

dow and watched two people get out of the car. The man was another stranger, but Miss Brennan looked almost the same as she had the last time Maggie had seen her. Her hair was different, of course; the frizzy bangs had been out of style for years and Miss Brennan had adopted something short and straight that stood up in spikes, like the models Maggie had seen in the newspaper. Instead of a blue gabardine suit and a frilly blouse she was wearing a sweater and slacks. She moved like a young woman and she looked like a young woman, but she was definitely the same Miss Brennan who had given Maggie those tests nearly half a century before. *Then what about me?* Maggie wondered. *Why am I older?* After the doorbell rang she waited fifteen seconds before she opened the door.

"Hello, Maggie, remember me?" Miss Brennan asked. The man stood behind her left shoulder, carrying a large suitcase.

Maggie the shy, Maggie the cautious scented danger. "I'm sorry, no." She hoped she sounded adult. "I'm afraid I don't."

"Cora Brennan? And this is my friend, Mr. Palmer." Miss Brennan had a polite, questioning smile. Maggie responded as she had seen her mother do to the Jehovah's Witnesses when they came to the door: with a tilt of her head and a blink of bewilderment. "May I come in?"

Maggie stepped back, trying not to look watchful.

"Oh, the rashness of radishes," Miss Brennan said, with a sort of anxious chuckle in her voice.

"I beg your pardon?"

"Just a joke," Miss Brennan said. "Maggie, you do know me. Are you sure you don't remember?" Maggie nodded. Miss Brennan seated herself on the couch; the new stranger, Mr. Palmer, plunked down beside her with the suitcase at his feet. Maggie perched on the edge of the wing chair.

"Tell me what you do remember," Miss Brennan said. Her smile was sweet, as it had been yesterday—no, years ago—and she leaned forward in such a sympathetic way that Maggie felt tears form in her eyes. In a moment she had blurted out that she really didn't remember much of anything. She'd just waked up that morning and felt strange . . . and here her caution rose, her fear of laughter took over: Maggie denied recalling the tests given when she was eight years old, "forgot" her new teacher's name and her mother's, "confessed" that she had figured out her own name from conversation and the address on an envelope.

"I think we can help you, Maggie," Miss Brennan said softly.

It was the same apparatus, or looked to be: the tin cap, the fine wires. Miss Brennan placed the cap on Maggie's head and began sticking the wires into her scalp. She was humming a little tune, not a lullaby but soothing, sleepy-making, with the same odd feel about it as the funny little phrase about radishes. Maggie fought to stay alert, to pay attention to what was happening. Mr. Palmer had a sleek grey box on his knees, into which all the wires from the cap disappeared. When she was done with the cap, Miss Brennan took the box from him and sat down.

"Come on, come on," she said under her breath. The box had a round window on top. Wiggly green lines crossed it. There were some dials, Maggie thought, still fighting sleep, and some . . . some . . .

A green light flickered. "She's down," Miss Brennan said, just as Maggie thought she would finally have to give in to the dark. She opened a little door in the box. From her angle the little door would hide the light, which Maggie saw go out.

"Make damn sure you've got the right cassette," Mr. Palmer said. "Shove the wrong record into her head and there'll be hell to pay."

"I've got the right cassette."

"She'll respond to the signal later, then. You're sure? The same signal?"

Miss Brennan flashed him a glance. "I'm not an idiot," she said.

"That remains to be proven." The man leaned over and checked the small square object in Miss Brennan's hand, nodded, and sat back.

Miss Brennan's mouth tightened. She inserted the thing she held into the part of the apparatus still in the suitcase. "I don't think it's as bad as Frank thought," she remarked.

An odd buzzing sensation coursed through Maggie's body, making her think of mists covering the valleys on fall mornings, of windshields speckled with rain, of paint concealing beautiful wood. Sunlight burned through the mists, wipers pushed the raindrops aside, someone scraped away the paint, and slowly, slowly, outlines of something emerged. A life. Her life. The sensation of knowing who she was, where she was, and how she had come

to be there returned. But Maggie was awake, conscious, listening, watching under her eyelashes to see what these two people would do as the missing years trickled back into her mind, centered now on the memory of a cold autumn night in 1943.

"What a snafu," Mr. Palmer said. "I don't know how you managed to go wrong on this one, Cora, really I don't, but it better be the only one. Too many like it and we'll lose control of this century." Miss Brennan shrugged. "You know what this woman could have been capable of," Mr. Palmer went on, almost whining. "Solve a few of these socioecological problems a few years too soon, and where do you think your Ecoloklenz or my Poputrol would be? Not listed on any stock exchange you'd care to name, that's for sure. Out of business, along with the rest of the consortium."

"She hasn't done anything. Not in our time-line." Miss Brennan's voice was cold and bland.

"Which is still pretty wobbly," Mr. Palmer snapped. "History likes to settle in grooves, you know that. It's the groove-makers we have to get at, like this one. Let her loose and you and I will be out of jobs, along with a lot of other people. Jobs!" he repeated high-voiced, running his hands through his hair. "Listen to me! A lot of people just plain won't exist. You, maybe, or me. She could cost us half our customer base—"

"Should we be talking?" Miss Brennan asked.

Mr. Palmer shrugged. "She's out." Maggie let her eyes close, sure he would turn to look at her. "Besides,

she'd never make sense of anything I said, not now that we've got her back where we want her."

"Waking," Maggie was careful to reply, "Ravishing," to Miss Brennan's remark about radishes. She expressed no surprise at finding a plate of cookies and three half-empty coffee cups on the low table in front of the couch: she remembered perfectly watching Miss Brennan do this bit of stage-setting, but she also knew that her daughter's friend Cora had dropped in with her fiancé on the chance that Susan was home. Or to be more precise, Maggie thought, she knew that was what she had been told to remember.

Watching the two visitors from the future walk back to their car, Maggie bit her lip, worrying about Susan and her brother and sister. . . .

Somehow, somebody's got to figure out how to make those two and their consortium, whatever that is, stop messing with people, she thought. Her fists clenched under her folded arms. Take the damn company right off every stock exchange for the rest of eternity. Dear God! Had these . . . these . . . leeches gone at her own kids? Maggie stood blinking, frowning, trying to recall whether anyone had suggested special testing, programs for gifted children, any occasion at all on which Cora Brennan or her like could have . . . what? Dulled their edge somehow, so they couldn't attack the problems her company didn't want solved until it got its filthy money out—

Frank's key went into the back door lock. Maggie turned away from the window at the sound. As the door opened she started for the kitchen to greet him

with her usual quick kiss.

Maggie Morgan rakes the leaves in her yard in the fall of 1993. She's an ordinary housewife, born in 1935, deep into middle age. Like many of her contemporaries, when Maggie's honest she admits she always made the easy choices. She graduated from high school at eighteen with all the right skills: typing, shorthand and bookkeeping. Her grades were on the good side of average—a disappointment to those who knew her as a young child, but consistent with her scores on standardized achievement tests. Two years out of high school she married a man she no longer quite trusts and quit her job as a secretary. She never went back to work: three children, two daughters and a son, took up her time. Now that they're out on their own she does fine needlework and serves as block captain for Neighborhood Crime Watch. Feminism and women's lib have passed her over. Her memory is spottier than most and less reliable than she'd like.

Like most women, Maggie has secrets: her theories about the future, about the force of trends in history, about people who change the past for their own profit without regard for what is best for other people or their own planet. Nightmares of endlessly proliferating futures and pasts sometimes wake her.

She has one more secret, shared only with her daughter Peggy, whose social security number she has used as her own.

For years, Maggie Morgan squirreled away what her mother would have called "sugar bowl money." Toward

the end of last July, when Maggie decided it was time to try out her plan, the account held almost three thousand dollars.

"I think I'll go shopping today," she remarked lazily that morning. Frank, drinking coffee behind the newspaper, grunted. "Downtown, I think," Maggie continued. "Carson's has a sale."

"Sure," Frank said. "Get what you want."

Maggie smiled, although Frank couldn't see her.

After he'd left for work, she tidied the kitchen, took a shower, and dressed to go shopping. Her hands trembled as she combed her hair; she needed both to put her lipstick on steadily. "Will it work?" she asked the mirror. Getting the expected answer—none—she pressed her lips over a tissue and threw the sedate pink kiss into the wastebasket. Before leaving to catch the bus, she opened the newspaper. The daily horoscope, from which she also expected nothing, obliged. She checked the stock exchange entry she had first noticed a month before: *Ecoloklénz*, trading yesterday at six and three-eighths. No listing for Poputrol yet. . . .

The broker Maggie chose was not with the firm Frank used. Opening an account took almost no time, a pleasant surprise, although as she'd anticipated the nice young man had reams of advice, not a word advocating her purchase of two hundred shares of *Econoklénz*. Convincing him to buy it for her did take time, but Maggie had learned a quiet stubbornness in the past two years. She left the broker with the order for two hundred shares at six and a quarter folded neatly in the zippered

pocket of her purse. On the way home she stopped at Carson's and absent-mindedly bought a white dress with egg-sized red flowers scattered over it, the first she tried on, and a necklace of red ceramic beads.

Nothing seemed to have changed.

Frank took her to dinner to show off the new dress. The weekend went by; Maggie walked her usual routes, shopped for groceries, cleaned the bathroom. The weather turned rainy. Nothing else changed.

Wednesday morning she brought in the mail, spotted an envelope from her new stockbroker, and opened it to find herself officially the owner of two hundred shares of common stock in *Econoklénz, Inc.*

Ganz gut, she thought, smiling.

Ganz gut? Maggie sank slowly into the nearest chair. Of course, that was German. She'd studied German in high school. . . .

No. Maggie Thornley had not studied German in high school. At least, this Maggie hadn't. But the old Maggie, the Maggie now eleven years old in the back of her mind, *that* Maggie would have studied German, to go with the chemistry and physics she'd also have studied, and the math that wasn't book-keeping. A right triangle formed in her mind. Geometry, yes, and trigonometry and algebra—

"It's working," she whispered. "It's working." The past was reshaping itself, or she had slipped into a future for which the past had been different. Maggie lifted a slat of the Venetian blind and looked out at the slanting rain. Still the same, exactly the same.

Almost the same.

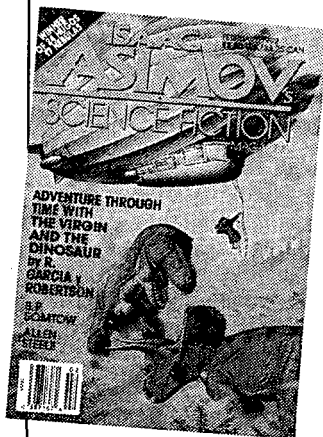
Slowly the world reshapes itself around Maggie Morgan. She has five hundred shares of Ecoloklenz, now—the nice young broker has completely caved in, though the stock has declined almost a point since Maggie bought her first shares—and she reads her husband's *Wall Street Journal* every day. Someday Poputrol will be listed, and she'll buy some of that. Maggie knows all about stock. She won't sign proxy votes without thinking hard. She'll find a way to attend stockholder's meetings. Nothing will be easy, that she knows, too: hadn't what's-his-name, Palmer, said the time-line was wobbly? Didn't that imply that changes were hard to make? But he called her a groove-maker, too. If she quietly enlists others . . . *zum Beispiel, meine Kinder*, Maggie thinks, and smiles.

Oh, but it's hard to keep the memories straight! Old Maggie, new Maggie, Maggie who lived those blurry years—

Always quiet, Maggie seldom talks about the past. In times of self-doubt she rereads a few scrawled pages kept in the drawer of the desk her Aunt Susan left to her, pages that might have come out of her own third-grade notebooks, but didn't; pages she has never shown her husband. A couple of years ago she took to keeping the favorite doll of her childhood sitting on her dresser. Even that doesn't seem especially significant to anyone who knows her; her husband thinks it an amusing side effect of the change of life all women undergo by fifty-five.

But inside Margaret Thornley Morgan still lives an eleven-year-old girl: wide awake, a little scared, very angry,

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and very, very bright. With at least twenty years of her life left she *knows* she'll make the difference. Other lives have intersected hers, Maggie thinks as she watches her rake bare the green lawn. Other children, four thousand of them were studied by the Institute. Maybe a few are having trouble with

their memories. Maybe she'll run a classified ad.

Only yesterday a fourteen-inch wall-eye made the 6:00 news, just by getting caught in a lake thought to be sterile since the water milfoil died out years ago. Pay attention: Maggie's story isn't over yet. ■

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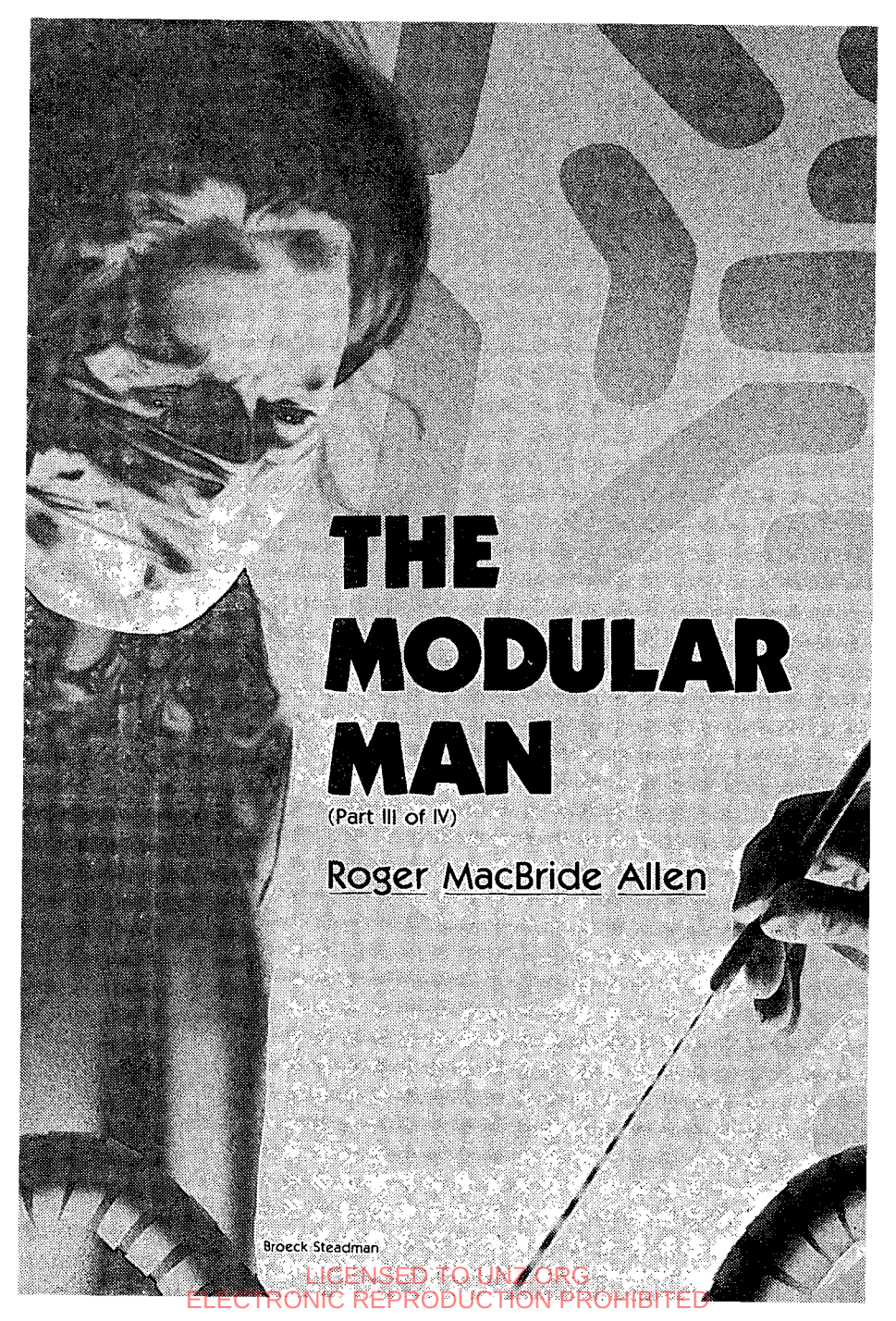
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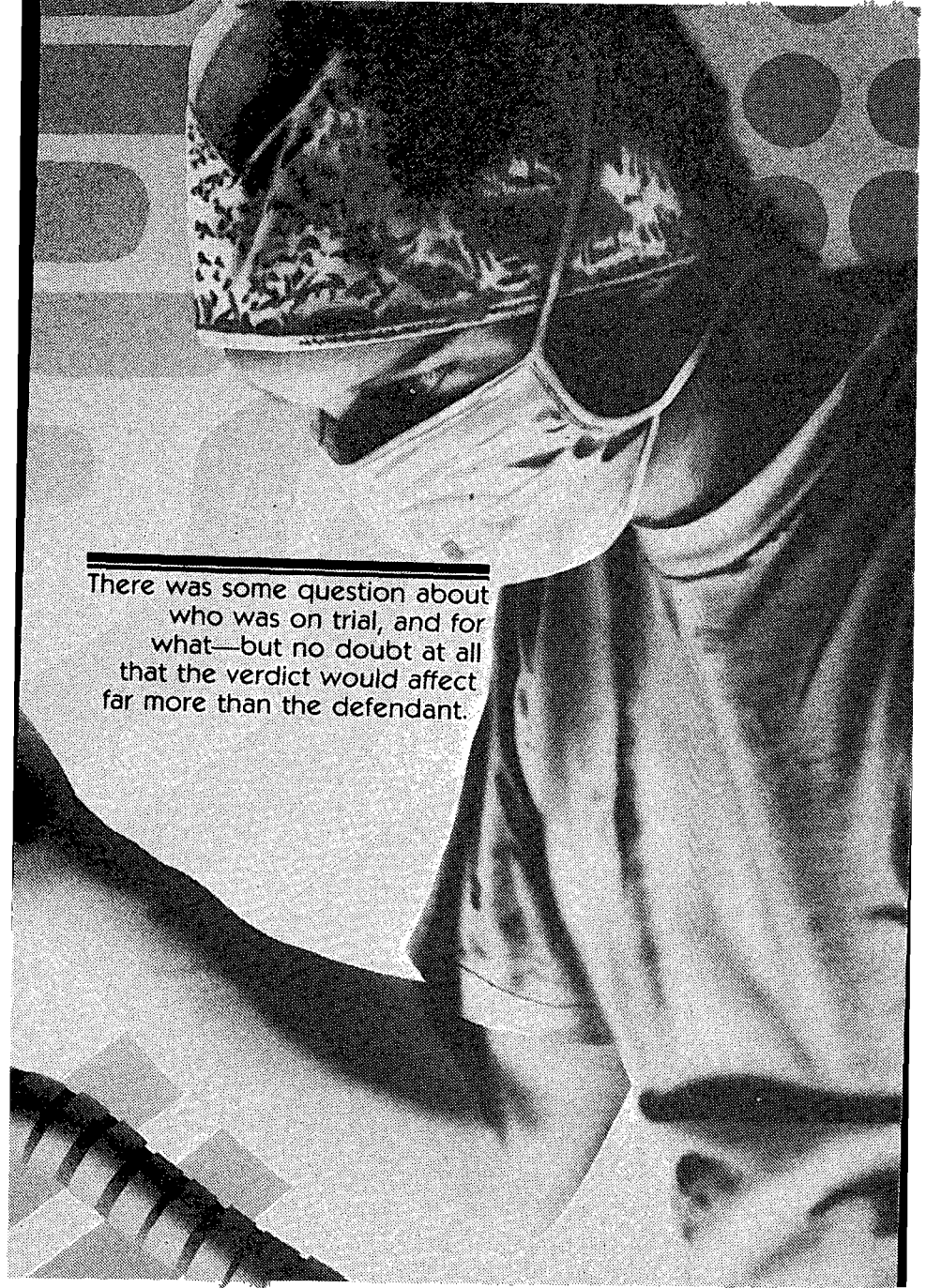
THE MODULAR MAN

(Part III of IV)

Roger MacBride Allen

Broeck Steadman

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There was some question about
who was on trial, and for
what—but no doubt at all
that the verdict would affect
far more than the defendant.

SYNOPSIS

The story opens in Washington D.C., in the year 2039, as Police Officer **Phil Sanders** is sent to the home of **Suzanne Jantille**. She is a noted criminal lawyer forced to retire on account of a severe accident six months before. Her husband, **David Bailey**, was also seriously injured in the same accident. He died three months after the incident. Since then Suzanne has lived as a recluse. Phil warns his partner on the arrest, **LuAnne Johnson**, not to be startled by Suzanne's appearance. It is possible that she is now a cyborg, or even a remote person.

Phil, usually assigned to the police department's robotic servicing department, is sent to see to it that a rather unusual arrest is properly carried out: he and his partner have been ordered to arrest **Herbert**, Suzanne's mute and distinctly non-humanoid home maintenance unit (HMU) robot. Herbert stands accused of the murder of Suzanne's husband, David. Suzanne meets with the officers; Phil and LuAnne are taken aback—she is indeed a remote person.

But that is of no consequence at the moment. The arrest warrant Phil has been sent to serve accuses David Bailey of copying his mind—or, as it is called, mindloading himself—into Herbert's brain. Mindloading a human mind has been illegal for years, but all robot minds are based on copies of old mindloads, done on volunteer terminal patients, or on loads from animals. The process of mindloading is always fatal to the subject in question. If Bailey copied his mind to Herbert, he therefore destroyed the original in the process.

In effect, Herbert the robot is being

arrested on a charge of murdering himself. This is spite of the fact that Herbert is incapable of speech, and has shown no indication of human intelligence whatsoever. Suzanne has lived with him in the months since David's death and has seen no indication of human behavior.

Unconvinced of the propriety of the charge against Herbert, and concerned that there is more charade than justice about the case, Phil leaks all the information about the situation to a Washington Post reporter, a rather determined young woman named **Samantha Crandall**. Phil sends the information to her by handing it to **Clancy Six**, one of a team of errand-running robots working at Washington Post.

According to the files Phil has leaked, US Attorney **Julia Entwistle** needs a case to establish a precedent. Entwistle holds that David Bailey is attempting to live on past his own death, something that many might wish to do, making inheritance and property law almost impossibly complex, and allowing some people to live almost forever, accumulating wealth and power at the expense of others.

Sam convinces her boss, the rather irascible **Gunther Nelson**, that she should run with the story, though it seems at first to belong in the nut file.

Suzanne Jantille decides to take on Herbert's case, though she flatly does not believe that her husband's mind still lives on. She too is concerned with precedent, and worried about what the case will do to limit the rights of cyborgs, who are already something of an oppressed minority. Many cyborgs have wiped out their life savings in order to

buy replacement body parts. They are regarded as street people, bums. Wealthier persons with organ replacements manage to keep their transplants quiet.

Suzanne visits her client, Herbert, at the police station, only to find that he has been locked not in a cell, but in an evidence room, where he has set himself to work tidying up—to the detriment of several pieces of evidence. Suzanne raises a fuss and insists that he be treated like the other prisoners.

In the course of the visit to her client, Suzanne's circumstances as a remote person become clearer—for it is not she who has visited her client, but a robotic body called a remote unit. Suzanne, paralyzed from the neck down since the car accident, has remained at home, operating the remote via neural implants. The system uses radio links between her and the remote unit out in the field. Ironically, it is the police sergeant's unthinking effort to treat her as a person that reminds her just how inhuman she had become. No tears will ever roll down her perfect plastic face.

Meanwhile, Sam Crandall attends a press conference and asks some embarrassing questions of Julia Entwistle and Police Chief **Joshua Thurman**. She asks why a vacuum cleaner has been arrested for murder. She manages to cause every bit of trouble that she hoped. Sam later meets with Phil Sanders. Phil explains the process of mind-loading to Sam. Though previous mindloads only managed to transfer a few percent of the human mind, David Bailey did make significant advances before his death. He might well have managed a complete mindload. Phil points

out some tantalizing evidence that suggests that it is just possible that David Bailey's mind—or at least some form of it—is indeed hidden away inside Herbert's body.

Phil Sanders tells Sam that Suzanne Jantille is a remote person and explains how a remote person system works, and the severe limitations of living as a remote. He reveals that his father was a remote person. Helping his father was how he got involved with robotics.

The next morning, after her story runs, Sam feels a bit of a letdown. Her boss, Gunther, prods her into pursuing the story. She attends the preliminary bail hearing. **Theodore Peng** a lawyer in the US attorney's office, is appointed to handle the prosecution of the case, though his instincts tell him that Julia Entwistle's courtroom strategy will backfire. He and Suzanne Jantille square off for the first time at Herbert's bail hearing. There is something of a stir in court when Suzanne Jantille's remote unit and Herbert the vacuum cleaner come into the room. A large crowd, made up in part of rather seedy cyborgs, fill the courtroom.

Both lawyers claim that they will be able to prove Herbert's humanity—and both sides are at least partially bluffing. The judge is deeply suspicious of all parties on both sides of the issue. He rules that the question of Herbert's humanity must be resolved in a new hearing before anything else can be decided. He gives the parties one week.

After the hearing ends, Suzanne hurries home with Herbert. Exhausted by her first real excursion outside the house since she became a remote, Su-

zanne powers down her remote without first caring for her bio-body, although it is rather frail.

Next day, Sam Crandall gets a deep background interview with Ted Peng, in which he admits his private ambivalence over the case. Assuming that Bailey has mindloaded himself into Herbert, then Herbert is half human and half machine—but the society and the law cannot accept any such grey area. Herbert must be declared either all human or all machine, or else cyborgs will inevitably become second-class citizens. Peng's boss, Julia Entwistle, firmly believes that the right to survive past death must be denied, or else society will split into wealthy, immortal, cybernetic "haves" who eventually accumulate all the wealth, leaving nothing but poverty for the short-lived "have-not" majority of the population.

PART III CHAPTER NINE

Straw Man

Suzanne awoke, stiff and cold. Old reflexes strained to pull the covers up over her chilled body, commanding useless hands that could never move again. It took a moment for Suzanne to come to herself and remember.

The room was cold. "Room, turn heat on. Close window." The window slid shut and a geyser of warm air welled up from the heating duct, bathing the room. She thought back to the night before. She realized that she had fallen asleep before she adjusted the room's windows and temperature by voice command. Just how tired had she been?

The warming air flowed across her,

but somehow it only made her shiver more. "Helmet on. Activate remote systems." The black helmet-halves swung up out of their recesses and closed about her head. There was a moment of darkness, then light and vision returned, flickering slightly at first before steadying down as the helmet screens adjusted themselves.

Suzanne-Remote stood up from her charge chair and let out a sigh of relief. That was better. True, the room was no warmer, and perhaps her bio-body was feeling the chill just as much as it had before, but with the remote on Suzanne scarcely noticed the discomfort.

Still, she really ought to do something to see after her bio-body. She went to the hall cupboard and pulled out an extra blanket. She returned to the bedroom and tucked the blanket in around herself. In the back of her mind, Suzanne knew she really ought to do more. Yesterday had been a tough job, and the bio-body always reflected stress, even if it did none of the actual work. When a tough moment came, its muscles would tense up involuntarily, its skin would break into a sweat. Her bio-body needed a bath and a rub-down, at the very least.

But Suzanne's mind was on other things. Sleep had refreshed her, and she was eager to get on with Herbert's case.

She hesitated for a long moment, torn between the challenges of her work and the drudgery of caring for herself. At last she decided. Let the tech-nurse worry about caring for the bio-body. That was what Suzanne was paying for, after all.

Suzanne-Remote did not notice Her-

bert was still with her until she nearly tripped over him on the way out of the room. She stepped around him and made her way out. He followed her into the hall, and Suzanne felt herself starting to get very nervous indeed. She definitely had *not* ordered Herbert to stay in her room all night, and *very* definitely had not ordered him to trot along at her heels as she went around the house. His default programming should have kicked in long ago, sending him back to his charging slot in the basement when no further orders were forthcoming.

Halfway down the hall to her office she stopped, turned around and looked at Herbert, really looked at him for the first time in quite a while. Odd that she had not really thought much about him, as an entity, in all that happened. True, he was a mute machine on roller legs, but he was her client, nonetheless. She looked at his front end and saw a cluster of sensors and cleaning attachments where his face should have been. A strange looking piece of hardware, that he was. His two flexible eyes swung around to regard her for a long moment, and the two of them stared at each other.

She thought about it. He had been following her around, tagging along wherever she went ever since they had left the courtroom. Maybe, just maybe, he *was* behaving like something other than a cleaning robot. Could this non-robotic behavior be offered as proof of Herbert's humanity?

Probably not, she told herself. Not when he was acting like a lonely dog, not a human being. Still, it was something. Somehow she could use it.

But right now, client or no, she

wanted Herbert out of her hair—and it couldn't be doing him any good to go this long without a charge. "Herbert," she said. "Go downstairs and plug into your charging slot for at least four hours. Absorb a full charge."

The robot hesitated for a long moment before it turned and walked away, toward the stairs. It didn't usually take Herbert a hundredth that long to process and obey an order. What was going on in his brain, Suzanne wondered. Was there even a mind there?

She went into her office, sat down at her desk and tried to think what to do first. She noticed the attention button on her autosec was blinking. There were messages waiting for her, but she didn't care. Right now the question was, what could she do to prove Herbert was human? She had promised to do it in a less than a week's time. She had not a scrap of evidence to support any such idea. Not to put too fine a point on it, she had been bluffing, trying to force Peng into a situation where he could not abandon his claim of Herbert's humanity later.

There was no real harm done if the prosecution did have evidence. So long as Herbert's humanity was proved, who cared who proved it? But wait a second. Suzanne suddenly sat bolt upright. Suppose Peng had been counter-bluffing? She was certain that the US attorney's office had not the slightest actual belief in Herbert's humanity. They were bringing the case for the sole reason of demolishing his claims to humanity and setting a precedent to flatten all the other potential Herberts out there.

Therefore Peng and Entwistle, in claiming to prove Herbert's humanity, were setting him up as a straw man,

trying to make him look big and substantial and dangerous. That way the effort needed to come along and knock him down later would look far more impressive.

But she was dreaming up contradictory motivations now. She pulled out a piece of paper and a pen and started noting down the possibilities. She needed to get her thoughts clear. She could have used a notetaker, of course, but somehow she objected to the use of complicated machines to do simple things, and never mind the obvious ironies. She wrote down a few possibilities.

1. *Entwhistle had been shopping for a case.* She had wanted something that would let her start gnawing away at the rights of cyborgs. She was playing this case to lose, thus establishing the precedent that body-dead equalled legally, completely dead. Julia Entwhistle wanted it set down as a point of law that the mind could not survive the body. In Herbert, she had found what she wanted.

2. *Entwhistle sincerely believed in Herbert as a human being.* She truly thought he had killed David, had become David. She saw him as a murderer, and was therefore quite properly seeking to prosecute.

Suzanne-Remote sat and stared at the paper for a long moment, and long habit made her lift her robot hand to her mouth, made her chew the tip of her pen thoughtfully. At last she wrote down one more possibility.

3. *Something in between.*

No, wait a second. Not *something*. *Someone*. She had been thinking about Entwhistle, and not about Peng.

And Theodore Peng was the answer, not Entwhistle. When the case moved from preparation into the courtroom, Entwhistle's generalship didn't matter so much. Suddenly Peng, the soldier in the trenches, was the one calling the shots. Suzanne realized that she had to understand him if she was to understand the situation.

OK, so think about Peng, she told herself. Peng was the one face to face with the real evidence and the real circumstances. Entwhistle was only interested in her theories and her politics, in making Law with a capital L. But Entwhistle had made the mistake of handing the case to a man with a conscience, who worried about the facts of the case as well as the theory. She could read that much in him.

All right, he had a conscience. What did *that* tell her? Put the fact of a conscience together with Peng's behavior in court, and what did it mean? Factor in the way he acted, the words he said, the way he had looked at Suzanne and Herbert and the judge. All the details, all the nuances. Suzanne did not know Peng at all, but she thought she knew his type, remembered them from her courtroom career.

She had always thought of his type as decent carnivores: Young, determined, ambitious, aggressive—and yet still possessed of a soul, of a sense of duty, and of a belief in justice. Trouble was that soul, duty, and justice could interfere with the prosecution of certain cases.

Other times they were a positive boon. Give a decent carnivore working for the prosecutor's office a good case, give a guy like Peng a case he could

really *believe* in, and he would pursue it, relentlessly, eagerly, to the bitter end. He would be an avenging angel of justice who would unblushingly play every card, try every gambit, force every opportunity, and bend every rule to the breaking point in order to win in a righteous cause.

He would sense any weakness, pursue any tiny flaw. Put just the tiniest drop of blood in the water, show the slightest vulnerability, and a virtuous shark like Peng would scent it a mile away, get there in a flash, sink his myriad teeth in deep and hang on.

But Peng's teeth hadn't been out yesterday afternoon. Suzanne thought back. There were a hundred ways he could have gone after her—if not to weaken her legal case, then to shake her confidence, to rattle her a bit and leave her with doubts.

And he hadn't. Instead, it was as if she had seen the wind go out of him—as soon as he had laid eyes on Herbert. As soon as he had seen her; Suzanne the robot, defending the pile of hardware that he had accused of killing her husband.

She sat up a little straighter.

That was it. As soon as the defendant and the defense lawyer in the case became real to Ted Peng, when they were no longer mere chess pieces, he had lost his enthusiasm for the case. Sooner or later every trial lawyer came up against a case that he or she had no faith in—a client that had to be in the wrong, a prosecution that was full of holes. Sticking with such a case was part of the job. But doing the job didn't mean you were on fire with enthusiasm. Peng was pursuing the case, yes, but with no real joy,

no real blood lust.

But why? She went back to her two possibilities, and circled the first one. It was the one she believed in.

Entwhistle had been shopping for a case. She stared at it for a long moment, and then added another sentence. *She was looking for a case she could lose.*

That *had* to be it. Plan A *had* been to lose this case, to establish that Herbert was not a person, and that no one like Herbert ever *could* be a person.

But then something had gone wrong. Or right, depending on how you looked at it. Maybe Suzanne had been bluffing, but Peng had been telling the truth in court. His people *had* found something, some real evidence that made it clear that Herbert could be a person. And if that were so, and Peng was still telling the truth when he said he had proof that Herbert caused David's death—then, technically, a crime *had* been committed, murder had been done as per the arguments Peng had made in open court.

But Peng did not like it. He believed in the facts, but did not like calling it a crime. Yes! That was it. Peng truly believed it had all happened, but he did not like the tortuous arguments that turned David's bid for survival—if indeed that was what happened—into a murder.

Which meant he was doing something he didn't like doing, and therefore was following Entwhistle's orders reluctantly.

Entwhistle wanted Herbert set up as a straw man, wanted him turned into a frightening threat to society. Then when she knocked him down, Entwhistle would look good. And Peng didn't like

his part of the job.

A low beeping brought Suzanne out of her reverie. She turned her head and saw the discreet amber of the answer-phone button blinking. Purely on reflex, she made a move as if to press it down and answer the call, but then stopped. Let the autosecretary do its job. The beeping stopped and the answer light faded out.

But the call reminded Suzanne that she ought to check her messages. Ever since the accident that had crippled her six months before, she had been drifting out of touch with the world. In the immediate aftermath of the car wreck she had been completely bedridden. But even after she had received the remote unit, she had been unwilling to step out into the world. Vanity, shame, embarrassment—all those emotions, and others she did not truly understand, had held her back.

Half by choice, and half by default, she had turned her back on the world. She could not bring herself to visit friends, or do business, or even step out of the house, in the guise of a robot. At last the world began to turn its back on *her*. Old friends gave up trying to break through her solitude. No doubt some were respecting her privacy, but others were simply unable to look at the thing she had become.

Suzanne had been living her life in almost complete seclusion. Days or weeks might have passed between calls. But now she was in the news, and everyone seemed to be calling. She was forced to cull her messages two or three times a day. In the process she made the surprising discovery that she resented the loss of her seclusion.

But, no matter how she felt about them, the calls and faxes and e-mail messages were coming in, and she had to deal with them. If she responded to all of them, she wouldn't have time to do anything else. She felt a real temptation to scram all of them, indiscriminately, erase the entire display and shun the world's intrusion.

Still, some of the calls might be important, might impinge on the case. She pushed a button or two on the autosec and her desk screen came to life, displaying a summary of the messages—voice, fax, and e-mail—that had come in since yesterday. She shook her head. The list was five screen-pages long.

It seemed like every news outfit in town was listed, along with a half-dozen political action groups, most of which she had never heard of before. Friends of the Cyborgs, the National Right to Death Council, and a few even more obscure. What should she do about them? She leaned back and thought for a moment. Politics. She had taken on the case in part for political reasons, to set a precedent to secure the rights of cyborgs—but that idea was getting a bit pale and far off in her mind. Besides, her old advocate's reflexes were taking over. It was her duty to act solely in her client's interests. All that she did, or did not do, had to be done with Herbert's best interests at heart.

With that in mind, she deleted all the messages from political types. All of them were people with axes to grind, one way or the other. She couldn't see how her helping to grind them would advance her client's case at all. Things were damnably complicated already.

Getting sucked up into someone else's cause could only make things worse. She cleared the screen display and brought up the calls from reporters. These she went through using the same criterion: would talking to this person help Herbert? That eliminated three-quarters of them immediately. The out-of-town papers, stations, and networks were first to go. She had no desire to have Herbert further paraded before the nation and the world like an exhibit from a high-tech freak show. She trimmed the list down to reporters that worked for news outlets that the judge, the potential jury, and the prosecutors might see. If she talked to them her words might find their way to places where they might do some good for her client. She was down to a handful of local reporters.

And from them, one name popped out at her. Samantha Crandall from the *Washington Post*. Suzanne had noticed her at the hearing yesterday, and had read her article with more than a little annoyance. The damnable woman had far too much information. She was on the point of erasing her name as well.

Then it occurred to Suzanne that information was a thing she very much needed. She thought of Peng's claims of incontrovertible proof. True, she would see it on Monday. The prosecutor's office was required by law to present the defense with all its evidence, sooner or later.

But it would seem that this Samantha Crandall had seen that information already. Which made her a possible conduit of information to Suzanne.

That outweighed any personal annoyance Suzanne might feel. She cleared

every other name off the screen, leaving Samantha Crandall there all alone. "Autoséc," she said, "return the call from Samantha Crandall. Put her through to me as soon as you have her."

"Do come in, Ms. Crandall. May I offer you some refreshment?" Samantha had to struggle in her effort not to stare at Suzanne Jantille-Remote. Damned off-putting to realize the *real* Jantille was tucked away elsewhere in the house, running this machine by remote control. Strange to talk to the puppet and have the master answer.

"Ah, no, no thank you," Sam said. In plain fact, it was a hot day and Sam could have done with something cool to drink. But she did not want to deal with perfect robot servants seeing to her every need—nor did she have the faintest idea what the etiquette of eating and drinking in front of a robotic host was. Her mother had always taught her it was rude to eat in front of someone who wasn't—but did that count in these circumstances?

Sam Crandall stepped into the huge expanse of the living room—or should it be called a salon, or by some other grand name that applied to rooms not found in the average house? The room was *big*, almost as large as the main room in Phillippe's place. But even if it had been a tenth the size, Suzanne Jantille's living room would have been overwhelming. The blond-wood floors, Oriental carpet, cream-colored walls, restrained pastel paintings, and very grand, upright chairs and sofas all seemed to register a certain disapproval of Sam.

The room's perfectly coordinated

cream-and-white color scheme seemed to chide Sam's choice of a summer-green skirt and beige blouse as hopelessly overstated. Everything about the room was relentlessly perfect, carefully chosen to match every other thing, achieving an overall effect of such perfect harmony that any outside element was bound to clash.

Sam sat down on the rather grand and formal couch, feeling a bit nervous. She shifted in her seat and knitted her hands together nervously, watching as Suzanne-Remote gracefully crossed to the sofa opposite and sat. Sam tried to smile at her host and was rewarded with a rather wooden nod in return. Was that the best the remote could do? No way to know. Sam found herself thinking back to how her mother had handled company, how hard she had always worked to put visitors at ease. *It must be tough to set a guest at ease in a room like this*, Sam thought. Then it occurred to her that at ease was the last thing in the world Jantille would want Sam to be. In a house this big, there had to be other, less imposing rooms available for the reception of guests. A breakfast nook, a den, a sun room, something. Jantille had chosen this room for the express purpose of keeping Sam off balance.

Well, *that* was worth knowing, anyway. Sam shook her head to herself. It told her a little bit about the tone this interview was likely to take. "Let's get started, shall we?" she asked, pulling out her notetaker.

"Fine," Suzanne-Remote said. The expressionless calm on Suzanne's plastic face somehow seemed a bit warmer now, but Sam decided she must be

imagining things.

Sam thought back to her visit with Phillippe, remembering the denuded head of the remote there. Unzip this, unscrew that, peel back those layers, and the urbane, elegant lawyer she was talking with would look like that grinning skull. She shivered, but then forced the thought away. It was time to get down to business. "All right, then. Maybe it's not quite on the subject, but there's a side-issue I'd like to ask about first. How did it feel for you to get back into a courtroom? You'd been away a long time."

Suzanne tilted her head to one side, as if in surprise. She thought for a moment. "Good," she said at last. "Perhaps a bit unsettling, but that was part of what made it exciting. This case is a tough one on any number of levels. There's uncertainty in it. I've always felt a bit of exhilaration in heading out into unknown territory. Here we've got a case where virtually none of the facts are in doubt, and yet almost every *issue* is in doubt. If that doesn't force you to be on your toes, I don't know what would."

"So you prefer this sort of challenge to a cut-and-dried case."

Suzanne nodded. "Most people seem to assume that lawyers like simple cases, the ones with straightforward questions. But it's the doubts, the uncertainties that give us a job in the first place. If it were always readily apparent who was right and who was wrong, we wouldn't need lawyers. And any trial lawyer who says she or he doesn't enjoy a good fight is lying."

Nice quote, Sam thought. It would look good in the paper, but it sounded

a bit rehearsed. Maybe if she twitted Jantille a bit, her subject would reward Sam with something a bit juicier. "Let's be real here, for a second," Sam said. "I can't quite buy what you're saying about doubt!"

"What do you mean?" Suzanne asked.

"Nine times out of ten, by the time a case gets to trial, everyone knows perfectly well what happened. Don't the lawyers—defense lawyers in particular—earn their keep by trying to *manufacture* uncertainty?"

Suzanne Jantille sat up a bit straighter and frowned. "I'm afraid I don't understand."

Or don't wish to understand, Sam thought, a bit viciously. "Beyond a reasonable doubt," she quoted. "Isn't that the key to it? There are a million things that happen every day, and we all know they happened—but you couldn't *prove* they did. Especially not if someone else came along looking for a way to introduce that reasonable doubt."

"I used to play that game with myself," Suzanne said, with something a bit cautious in her voice. "Back when I was just beginning to try cases."

"What game?"

"Well, let me give an example." She paused and thought for a moment. Suddenly the remote gave off a strange, barking sort of noise without moving its mouth. It flailed its arms about convulsively, in an awkward and mechanical spasm of movement. Whatever illusion of humanity it had shown vanished, at least for the moment. It looked like a robot, and a malfunctioning one at that. "Excuse me," it said, in an echo of Suzanne's voice that was suddenly a bit

raspy. "It would appear I'm developing a bit of a cold, and my remote insists on echoing my cough in full sound and action, even if it doesn't do it very well. The facial controls weren't programmed to cough, and the cough reflex confuses the induction controllers. Let me get some water."

Well, OK, Sam told herself, maybe it had *sounded* like a cough, but it sure didn't look like one. Strange that such a commonplace sound would seem so bizarre just because the visual cues didn't match. Let her get some water and get on with it. Sam half expected the machine to stand up and head for the kitchen, but instead the remote suddenly froze up, stopped moving altogether. After a moment, she understood. Somewhere in the house, Sam knew, a drinking tube was extruding itself toward the paralyzed woman's mouth, and she was sucking water through it to clear her throat. Just as well the machine did cut out. It would have been doubly disconcerting to see the remote turn its head and wrap its mouth around an imaginary straw as it echoed Suzanne's movements.

There was another strange noise from the remote, a bit more subdued, and with the spasming absent altogether. Suzanne was clearing her throat. "That's better. But anyway, I was talking about my imaginary cases. They were a bit silly, but I suppose everyone has private little games they play in their heads. I'd be walking along the street in the city, all sorts of people around, and suddenly I'd find myself picking out a couple of random strangers, turn one into a criminal and the other into a victim. I'd ask myself, sup-

pose the man fifty feet ahead of me stole that lady's purse? Could I identify him? Could I precisely indicate the spot it happened in? And the time? And if so, how could I *prove* it, nail time and place down. If the purse were produced in evidence, would I be able to identify it? Or else I'd make it more direct, and make myself the victim—or the criminal. No, scratch that—I'd play the plaintiff and suspect's viewpoints." Clearly, she had remembered she was talking to a reporter. "Plaintiffs and victims, suspects and criminals are all very different things. Make sure you clean that quote up for me, all right?" she asked, a note of concern in her voice.

"Of course," Sam said, trying to sound encouraging and reassuring. It was an old trick of the trade. If the reporter could get the interview subject to rely on the reporter's discretion, then the subject would be more likely to be indiscreet herself.

But that voice. Strange, fearfully strange to know there was a real woman, somewhere in this house, speaking those words to no one, into a microphone in an empty room. "Go on," Sam said.

"Well, the idea was to find out what the various parties would say," Suzanne continued. "What would be the likely points of agreement? What details would be likely to get mixed up? Who could lie about what and get away with it, in the face of whatever other evidence existed in the case? What would their motives be for lying and telling the truth?

"Then, once I had the whole thing together in my mind, I'd try to take it

all apart again, make it so all the pretty pieces I had strung together didn't fit together anymore."

"What do you mean?"

"I'd take the whole thing into the courthouse, and play all the parts at once, in my head. Judge, jury, prosecutor, defense counsel, plaintiff, suspect, witnesses. I'd imagine myself as a witness, and cross-examine myself. How did I know the time? How could I swear my client was the assailant when I only got a brief glimpse at him? There are a hundred stores selling purses just like that one. How could I be sure that the one produced in evidence was the one you saw? And then I'd go back again, play the prosecutor's side of the chess game again. That's how I taught myself something so I'd know it instinctively, in my gut: Lawyers don't worry about what happened—they worry about what they can *prove*, or what proofs they can dismantle. Every time I played the mind game, I'd realize after a while that I wasn't thinking about the hypothetical crime at all anymore—but about the *case* for and against the crime."

"Isn't that pretty much the same thing?" Sam asked.

"No, not at all. It's something very different." Suzanne said, her voice and posture betraying her enthusiasm. "You were talking about it yourself a minute ago. Manufacturing certainty and uncertainty. That's what lawyers do. We take the facts of the case, try and hide the facts that weaken our side, dispute them where we can. We overstate the facts that make our side seem strong. We try to make the witnesses seem smart or stupid, honest or misleading, confident or confused, as suits

our turn. Meanwhile opposing counsel is playing the same hand from the other side, while the judge keeps an eye on how far we bend the rules. Then the jury decides who pulls in the chips."

"You make it sound more like a poker game than a court of law," Sam said. She thought back to what Peng had told her. The words had been different, but the tone had been much the same. Cynicism wasn't quite the word for it, for they both believed in what they were doing. But they both had a strange double vision of *how* they did their jobs. Seeing it half in cold-blooded detachment, and half as a game they loved to play.

"It is a poker game," Suzanne said. "Bluffing, counter-bluffing, raising the stakes, folding when your hand isn't worth the risk, blowing a good hand now and then because your nerve fails or you misread something." She thought for a moment, and then spoke again. "There's another point that makes the poker analogy even stronger: Any hand can win, any hand can lose. You can be holding a royal flush and be forced to fold if you don't have enough chips to keep up with the betting. And five random cards can win if you hide your weaknesses well enough, and intimidate the other player with tough betting."

"So what do the cards you got dealt look like?" Sam asked. "And what are you using for chips?"

Suzanne-Remote's expressionless face did not betray any reaction, but her head cocked to one side, and she waved an admonishing finger at Samantha. "Never show your cards till you're called, and never show your whole

stake."

"All right then," Sam said. She hadn't expected anything more than that. "What do you think of the way Peng is playing his hand?"

"Damned if I know."

"He made some strong claims about being able to prove Herbert's humanity—and his guilt," Sam said. "Are you saying you don't believe he has that proof?"

"I can't answer that one way or the other," Suzanne said.

Sam hesitated for a long moment, and then decided to plunge in. "I've got a friend, my source on a lot of this story. I put in a call to him this morning, and he confirmed that he didn't see any such evidence."

Suzanne leaned in toward Sam. There was something a bit anxious about the movement, as if she had been hoping to hear something to such an effect.

"Did he have good access to the evidence?" Suzanne asked. "Would he know what he was looking for?"

"He's very good at this sort of thing," Sam said, a bit cautiously. She looked hard at Suzanne. "You don't think Herbert's human," she said at last. She could read that much from Suzanne. "Or at least, you're not sure, one way or the other."

"I certainly—"

"I wasn't asking a question," Sam said. "And you sure as hell won't let me quote you on that point. But I can see it, plain as day. You're not sure."

Suzanne slumped back a little. "Off the record, utterly and totally off the record, I'm not. How could I be? Up until the time of his arrest, it had never

entered my head that he was anything but a perfectly ordinary machine. But since then—I've changed my mind a hundred times. I've noticed him doing things that just aren't what robots do."

A light came on in Sam's head. "That's what my friend showed me, too. Un-robotic behavior. It's just struck me that if the job were to prove Herbert *wasn't* a robot, things would be a lot easier."

"But a lot of things that aren't robots aren't human, so that's not much help," Suzanne said. She leaned in closer again, and spoke in low, confiding tones. "This friend of yours, this source. You know there are questions I can't answer, and I know there are things you can't do. You can't reveal a source without the source's permission. But I need some help right now. I need to see the evidence and get some analysis on it—and get a private, expert opinion on Herbert. Your friend sounds like he might be able to do all those things, and sounds like he might be sympathetic to our side. Do you think he or she might agree to meet me?"

Sam looked hard into Suzanne-Remote's plastic eyes. This was the moment. Here was the time and place where she decided clearly and precisely whether she merely wanted to report this story, or whether she wanted to become part of it. Make the news instead of simply telling about it.

Reporters were supposed to be observers, not doers. But no worthy reporter had ever worked who did not believe that things had to be changed, turned upside down, sometimes.

If she sat silent now, she could tell herself that she had done the right thing,

behaved in accordance with the standards of journalistic ethics. Her conscience would be clear.

And maybe Herbert would be condemned to death, and a whole class of people would be made into second-rate citizens for all time to come.

Or else she could speak the name, and damn the rules and do what was right, instead of what satisfied the norms.

She thought back to the original arrest, and wondered, not for the first time, how Phillippe's service as the arresting officer had been arranged.

"I think I can arrange it," Sam said at last. "As a matter of fact, I believe you've already met him."

CHAPTER TEN

Schrödinger's Robot

"There isn't any point to this," Suzanne Jantille-Remote said, staring into the daylight that sped past the windows of her relay van. "My husband is dead. None of these games will change that fact."

She shouldn't say things like that to a reporter, Sam thought. Suzanne Jantille's mood had darkened, and she was talking far less cautiously. Sam knew, somehow, that as a reporter, she should be taking advantage of Jantille's moodiness to get more information, but she couldn't bring herself to do it. For once, behaving with a bit of human decency was higher on her list. "My friend doesn't think he's dead," Sam said.

"My husband died three months ago, and no evidence manufactured by the US attorney will change that fact," Suzanne said. Sam noticed there was a slight quaver to Suzanne's voice, as if

she was in some pain or discomfort and was trying to hide it.

Sam turned her eyes back to Herbert. His massive bulk was crowding up the interior of the relay van. His size was just a trifle intimidating, to say the least, and her overactive imagination would insist on reminding her that this machine had quite probably killed someone. At the very least he had been there when the death happened. By accident or design, whether Herbert was a sentient being or a mere pile of hardware, he had been there when the breath of life left David Bailey's body. That was plain fact, never mind the legal niceties about whether he could be held to account for it.

Sam settled back into her seat as best she could. Here she was being driven around by a robotic vehicle, her only companions two robots, one a possible killer and the other a puppet on the string of a paralyzed and highly agitated woman. It was an incongruous situation, but for some reason Sam found it more than odd. It was downright disturbing, and she could not think why.

Then it came to her. For the first time in her life, she was aware of the fact that she was in a place where humans were not in the majority. No doubt she had been surrounded by robots before in her life—she could think of a half dozen moments right off the top of her head. But she had never been *worried* by it before, never before been disturbed. . . .

Now it dawned on her that her sort, the ruling class of flesh-and-blood, was potentially the weaker party. The human world would not function at all without the cyborgs and robots and

HTMs and lesser machines doing all the dirty and unpleasant work. What would happen if the members of society not accepted as fully human decided to watch out for themselves instead of doing the bidding of humans?

Sam was shocked even to realize such a thing was remotely possible, that the present arrangement was not immutable. How often before in history had someone stumbled across the idea? What had it felt like to be an Englishman of the Indian Raj in the 1930s, when he suddenly realized the Indians outnumbered his kind a hundred to one? Or an American slave owner in 1865, at the exact moment when war ended and the slaves were slaves no longer?

Sam frowned. Why was she thinking in terms of overlords and peoples being made free? Was that what robots and cyborgs were? Slaves? But slaves were oppressed *people*. Were robots people, could robots be people, should they be free? Would they, inevitably, someday, be free, and powerful?

For the briefest flicker of time, Sam saw a future. Not the time that would be, but the time that *might* be—and it was a deeply unsettling place. It was Julia Entwhistle's vision, as described by Ted Peng, a world overrun by the rich who refused to die, encased in their flawless mechanical bodies.

Sam looked at the big HMU robot hunkered down on the other side of the van. It might or might not be that the Feds were wrong about Herbert for now, but they wouldn't be wrong forever.

Sam looked at Suzanne-Remote. Such compromises as remotes and cyborgs were mere stop-gaps, temporary

solutions while technology matured. Sooner or later, dead minds *would* be fully and accurately recorded into bodies of metal and plastic. And those bodies would never have to die. The mechanical survivors of death would accumulate, their numbers always growing, until. . . .

Sam blinked and came back to herself. Until it would always be like this moment here, with the flesh-and-blood people in the minority. Until one day the flesh-and-bloods looked up to realize that the robot-bodied populace was already gaining control, had already gone past being *people* and become something else.

It was not a new idea, not at all. People had been discussing such things for years, decades. But riding in this van with a pair of machines she was supposed to treat like people brought it home, made it real, immediate, personal.

Sam shivered. She did not want that world. She wanted *people* around, wanted her children to live and die having fingers and toes, bruised knees, and broken hearts. People were meant to have *lives*, not battery packs or cable assemblies or memory downloads.

But Suzanne had said her client was *not* human, not a person. She wasn't seeing the world. "Do you really believe your husband is dead?" Sam asked. Suddenly the question was vitally important. She needed to know what Suzanne thought a person was. "Woman to woman, no quotation, you're not a lawyer and I'm not a reporter. Do you, right now, believe it?"

"I sometimes wonder if *I'm* alive," Suzanne said. "I can forget my own

living body so completely, become so involved in the job of controlling this *robot* body, that I begin to think of *myself* as a machine. But that doesn't answer your question, does it? Is David alive or dead?" Suzanne thought for a moment and then shook her head. "The things Peng said at the hearing about David becoming a new person ring true to me, and that scares the hell out of me. *I'm* not the same person I was before—before I turned into *this*." Suzanne gestured with her left arm, down at her body. "And I still have the same number of arms and legs, I'm still using the same brain I used to have. But if David *did* put his mind in Herbert, none of that is true for him. How could he *not* be different?"

Suzanne thought for a minute, and then spoke again. "Is David alive?" That seems like a single, very simple question. But I've been thinking about it, and I've concluded that two very complicated questions are hiding inside it.

"First—is there someone alive inside of Herbert, or is he merely malfunctioning in some odd and subtle way? Second—if there is someone alive in there, was he once David Bailey, is he David now, and if not, *who is he*?"

Suzanne looked at Sam, but there was nothing for the younger woman to say.

Suzanne shook her head and looked over at Herbert. "If your friend can answer all those questions, I'll be very impressed with him indeed."

Suzanne Jantille made her way into the elevator with a fair degree of nervousness, following Herbert and Sam Crandall. It wasn't just the building,

though the place was strange and disconcerting in its own right. At least the place had a decent hookup for her relay van, surprising in an old popdrop condo in this part of town. What bothered her was Samantha Crandall's flat refusal to say who they were going to see. Crandall had even said her friend had met Suzanne. But then what reason could there be for the secrecy—especially as all would be revealed as soon as their host opened the door? Suzanne was getting the idea from Sam that the reporter feared Suzanne would refuse to see the person if she knew who it was.

The elevator arrived at its destination and the three of them stepped out into a good-sized vestibule. Sam led them to the one door at the far end of the hall, and it opened as they approached.

A dark-featured, handsome young man stood in the doorway, dressed in a plain tan shirt and slacks. But he *did* look familiar. There was something about him that—

"Good God. You're the one who arrested him," she said in shock. Suzanne turned toward Sam accusingly. Now she could understand the reporter's reluctance to give a name. "*This* is the friend who's going to help Herbert?"

But before Sam Crandall could speak, the policeman did, in a low, calm voice full of confidence. "The name's Phillippe Sanders, ma'am. On duty I do what I'm told. I'm off duty now. I'm not spying for anyone or looking to spring any traps. I'm just a guy who knows robotics who might be able to give you a hand. And if you don't want my help, you don't have to take it. But are you likely to get many other offers before the hearing reconvenes?"

Suzanne's head swiveled around sharply, with the click and whir of mechanical precision, with no attempt to disguise the movement as something human and graceful. She stood motionless for an endless moment, staring at her host, glittering plastic eyes boring into him. Phillippe returned the gaze calmly, steadily.

Sam watched the two of them, feeling very much afraid, though she was not sure of what. Forces were coming together here, gathering themselves to look into new places, to look for a lost soul where no soul had ever been.

All three of them were breaking the rules of their respective professions, just by coming together. Sam was supposed to report the news, not create it. Reporters weren't supposed to interfere. Cops weren't supposed to help defense lawyers, and certainly weren't supposed to meet secretly with lawyers involved in cases they had busted. And defense lawyers most definitely were not supposed to receive stolen evidence files from cops.

At last Suzanne stepped forward, through the door, and Phillippe backed up, letting her through. Herbert and Sam followed behind. Sam breathed a sigh of relief. It was too late now. The deed had been done, and they had all done it together.

The place looked nothing like the way it had the last time Sam had been here. All the furniture, all the storage cabinets, all the work tables were just as they had been—but the light of day was pouring in the high windows from the blue sky, banishing any illusion of mystery or strangeness. It was an ordinary place, a workshop where a man

repaired machines. Even the dust cloths draped over the machines on the workbenches looked perfectly normal. No ghosts looming out at her today.

Sam looked toward one particular spot on one particular table, and made damn sure there was no shrouded shape sitting there. Good. The remote unit Phillipe had been working on—the remote that Phil's father had used—was missing. In fact, everything had been cleared from that one table. Either Phillipe had sold or donated the remote already, or else he had hidden it away, having the good sense to keep Suzanne from seeing it. It could not be a pleasant thing to see your fellow being half taken apart.

Phillipe stepped ahead of the others and walked into the center of the workroom. He stood by the empty work table, turned, and looked at his visitors. "OK," he said, "where do we start?"

Suzanne cocked her head in surprise. "I thought you would know."

"All I got was one quick phone call from Sam, saying she was bringing you here," Phil said. "Nothing else. What is it you want?"

"Help," Suzanne said simply, looking steadily at him. Phillipe leaned back on the workbench and folded his arms on his chest. Distrust and suspicion hung heavy in the air.

"Help with what?" he asked.

"With Herbert, obviously," Suzanne said, her voice irritable. Suddenly she was caught up in another coughing fit, this one just as spasmodic and disconcerting as the one Sam had seen at Suzanne's house.

Sam had seen it before, and yet it still startled her. Phil, on the other hand,

was clearly more concerned than surprised. All the curtness came out of his voice, and he stepped toward her, but stayed clear of her flailing arms. Obviously he was familiar with robotic strength, and did not want to get in its way when it was out of control. He waited until the fit was past, and then stepped closer, his face worried. "Madame Jantille, are you all right?"

"Yes, fine. No problem at all. Just a slight cough."

"No, ma'am, that cough was a lot more than slight. Are you taking proper care of your bio-body?" he asked, a bit severely.

"What business is it of yours?" Suzanne asked angrily, stepping back from Phillipe, moving a bit stiffly.

"None," Phillipe said evenly. "Except that my father was a remote person, and he died of a slight cough. It was advanced double pneumonia by the time he finally admitted there was something wrong."

"You sound just like my technician," Suzanne said impatiently.

"Well, maybe you should listen to both of us," Phillipe said.

"What the devil would you know about it?" Suzanne demanded.

Sam drew in her breath and stared at the two of them, the remote unit and the man, standing still as statues, glaring at each other. At last Phil spoke, and broke the moment.

"I know about it because it's my business," Phillipe said. "Because dealing with robots is what I do."

"I am not a robot," Suzanne said.

"No, ma'am, and that is exactly my point. You feel yourself to be in this body in front of me now, strong and

healthy and capable. And this remote body in front of me is all those things. But it is not *you* in front of me. It is a machine. *You* are home, alone, with a bad cold, if not something worse. An illness of some sort that you are struggling to ignore because you have enough weaknesses and vulnerabilities in your life without admitting a new one."

There was something in Phil's tone, in the passion and the feeling of his words, that seemed to disarm Suzanne. "Very well, then. I will take your words under advisement. I will talk with my tech-nurse tomorrow, and do whatever he tells me. With that said, can we return to the question of Herbert?"

Suzanne's surrender seemed to disarm Phillippe right back. "Yes, yes. Of course," he said. "But can you tell me exactly what sort of help you want from me?"

"Two things," Sam said, speaking for the first time. Maybe if the words came from her the anger in the room would back off a ways. Both Phil and Suzanne turned and looked at her, seemingly surprised to see her there. Sam found it most disconcerting that they had both forgotten her presence. "I think there are two things we need, Phil," Sam repeated in a firmer voice, as if staking out her right to speak. "We need to know if David Bailey is in there, and we need to figure out what the US attorney's evidence of murder is."

"Or if it exists at all," Phil said thoughtfully.

Suzanne nodded. "So I'm not the only one thinking that might be a bluff?"

"It might well be. I've been chewing

it over, and either it's a bluff, the data files I got access to—the ones Sam based her story on—have been manipulated, or else the evidence is there, in the data, but I've overlooked it."

"What's the odds on your data being manipulated?" Sam asked. "Maybe *your* source is yanking your chain. What chance of that?"

Phil shook his head. "Next to zero. Not with my source."

"And who might that be?" Sam said, knowing damn well she shouldn't be asking that question.

Phil rubbed his hand over his chin and shrugged. "I might as well tell you and save you lots of guessing. But if it gets in the paper, my source's head comes off, and so does mine—and I'll see to it you and Madame Jantille get pulled down too. That clear? I need it kept *quiet*."

"Perfectly. I'll keep quiet," Sam said. "Madame Jantille?"

"I will honor your confidence," she said in a careful, formal voice. "I will not reveal what you tell me. And anyone who's trying to tap my communications back and forth between here and my home is going to have some problems. Everything is shielded and encrypted."

Phil hesitated a moment longer and then plunged in. "OK then. It was the Chief."

"Good God." Suzanne was stunned.

Sam was just as surprised, but after half a second's thought, it made sense to her. After all, the Chief did not care for Entwistle. "Wait a second, Phil," she said. "I need details on this. How did it work? The Chief didn't just waltz up to you and say 'Here, Phil, here's

my package of evidence to suborn.””

“No, of course not,” Phil said, a bit stiffly. “But if you’re not going to reveal what I tell you, why the hell do you need details?”

“Because she needs to know if you’re telling a convincing story,” Suzanne said, recovering quickly from her own surprise. “You’re breaking a hell of lots of rules meeting with us. And Sam’s got to be wondering if you’ve been *instructed* to break those rules as a way to set us up. Entwhistle could use this meeting to get me thrown off the case.”

Phil looked at each of his visitors in turn; his gaze ending on Sam. She found to her surprise that she had a little trouble returning it. “Nice to be trusted,” Phil said at last. “But I guess I can see the need, looking at it from your direction. I think I know the Chief’s reasons for what he did. He didn’t like the case, he didn’t trust Entwhistle, and he did not want a precedent set where his cops would be forced to go out and arrest cyborgs on charges of staying alive—which is, when you come right down to it, what this is all about. If she can make that a crime under certain circumstances, all she has to do is widen the circumstances and anyone who needs a machine to live is in trouble.”

“That thought had crossed my mind. But why would that idea upset Chief Thurman enough that he would leak confidential police information? *He’s* not a cyborg. Surely he’s had to enforce other laws he didn’t approve of.”

“Yes, he has. But this goes beyond that. This is a question of *making* law, setting precedents. Right now, Entwhis-

tle is trying to establish that doing what she thinks David Bailey tried to do is a crime. It is by no means yet established that such is the case. My guess is that the Chief is trying to prevent it from coming to pass.”

“You’re talking like a lawyer all of a sudden,” Suzanne said, and there was something a bit less intimidating about her manner. “But I can’t believe Thurman just called you into his office and said ‘Here, Sanders, go out and break the law.’”

“No, of course not,” Phil said. “He came to me at the repair yard, the night before the arrest.”

“The Chief came to *you*?” Sam asked, astonished.

“It was quieter that way,” Phil explained. “If I had been called to his office, it would’ve been all over the yard the next morning. But everyone knows Thurman likes to wander around his commands once in a while, just pop up and see how things are going. So he dropped by the yard, and no one paid much attention.”

“And?”

“And he handed me a datacube and told me my sergeant was going to pull me off tech detail to make a bust the next day. One that would involve robotics. He wanted an expert there to make the pinch, just to make sure no one screwed the pooch,” Phil went on, unconsciously shifting from legalese to cop slang. “And he handed me the cube, and told me to read up on the case.”

“And that’s all?” Suzanne protested. “Out of that you read that the chief of police wants you to start leaking indictment files to the press?”

"That's plenty," Sam broke in, "What the hell else was he expecting Phil to do? He had to have pulled Phil's file, learned something about him first. He must have known that you were sympathetic to cyborgs and remotes and robots."

"So he sends you in to sabotage the arrest," Suzanne said.

"No, ma'am," Phil said firmly. "You were there, you must have played the recordings back. You of all people should know that I *rescued* the arrest. If Johnson had gone in alone, she would have cocked it up six ways from Sunday. You could have gotten the whole damn thing thrown out five minutes after you walked into court. If he wanted a crash-and-burn bust, he would have sent Johnson in alone. The Chief had to know that about me, too—that I do a job right if I'm going to do it at all."

"Except you don't mind leaking evidence when it suits your turn," Suzanne said.

"Hold it a minute," Sam protested. "You're here to ask Phil's help. He doesn't deserve to be treated like a hostile witness on the stand."

"No, it's all right, Sam" Phil said. "She's got to understand my motives in all this, trust them—or she'd be crazy to let me near Herbert with a screw-driver."

Suzanne ignored the interruption. "Let's go back to what you think the Chief wanted of you. You said it wasn't a sabotaged arrest. What do think he wanted instead?"

"Well, I didn't get a chance to finish telling you about my talk with the Chief. He didn't say go out and leak

this information. But he *did* say that he would count on me to see to it that the defendant was on a level playing field," said Phil. "He said that there were some serious manipulations of the process happening. Things done, not in the name of justice, but of winning at any cost. He said that wasn't right, that the police had the same duty as anyone else in law enforcement to look out for the rights of the accused."

"That's quite a statement from the chief of police," Sam said.

"Chief Thurman is quite a guy," Phil said.

Sam looked at her friend, and considered his words. There was obvious admiration in his voice when he spoke of the Chief. It was clear that Phil's loyalty to the man was the driving force here, the factor that had made him willing to break the rules, take the chances he was taking. Phil was doing this, at least in part, because he believed in Thurman, and trusted his motives far enough to do his unspoken bidding.

But Sam had a little trouble seeing a police chief, even an honest and dedicated one, working solely from altruistic motives. There had to be more to Thurman than that, and it made her uncomfortable to think Phil might think otherwise. To her practiced eye, it was obvious that Thurman had carefully arranged matters to provide himself with deniability. Which could make things very sticky for Phil. "Good guy or not," she said, "he had an angle on this. What was it?"

"Oh, he had one," Phil said matter-of-factly. Maybe he wasn't suffering from any delusions after all. "He didn't pretend otherwise. It's a pretty obvious

one, at least from the police point of view. Thurman said he wondered what the next step would be if Entwhistle got her way. He asked me, how would it look in the news to have his cops sent out onto the streets to bust cyborgs for breathing? Not good publicity for the force, and miserable for morale. And he hates Entwhistle. If she wants something, he doesn't want it."

"And what did Entwhistle want?" Suzanne asked.

"A case against some poor dumb sap who couldn't speak for himself and couldn't hire a decent lawyer," Phil said bluntly. "They weren't counting on you, ma'am. There are some internal office memos in the datacube." Phil hesitated for a moment. "The files make it clear that Entwhistle and Peng weren't counting on you to be, uh, well, available," he finished, a bit awkwardly.

"I doubt they were that polite about it," Suzanne said coolly. "I'm sure they assumed that I'd stay inside my house staring into my navel, just as I have been doing since the accident. I must admit there was some reason to support such an assumption. But in any event they expected that I would be incompetent or unwilling to serve as defense counsel."

"That's about right. The one thing Entwhistle wasn't looking for was a fair fight. She wanted a mute represented by a lightweight, preferably some kid fresh out of law school. Or else someone you'd hired just to make the case go away."

"Someone who would go for the quick win, claim Herbert had no legal standing," Suzanne said, thinking out

loud. "The case would be thrown out, and Entwhistle would lose, just the way she wanted to lose, by having Herbert declared nonhuman. She'd have her ruling, her precedent. Even if Herbert's lawyer stuck with the case after that, took it to trial, odds are he'd have lost. Herbert would be convicted—and the case would be appealed automatically. Then the US attorney's office could cut a deal, offer to concur in a motion to have the appeals judge overturn the conviction, so long as the motion was filed on the grounds that Herbert was nonhuman and thus couldn't be tried. That would even be better for Entwhistle. An appellate ruling would have more teeth. Either way, she could go on to the next step, the next case limiting the rights of cyborgs, with a little more muscle behind her."

"There's something else," Sam said. "Remember Peng talked about a law currently on the books in D.C., making suicide a crime. Not just *attempted* suicide, but the successful act itself was made a punishable act. I checked into that. It was introduced as one teeny part of an omnibus crime bill two years ago. Guess whose office wrote the first draft of that bill and handed it to the mayor's office for submission to the Council?"

"Two years ago?" Phil let out a low whistle. "So the old girl has been planning this for a while. Has she spent all that time shopping for a case she liked?"

"That's what it looks like," Sam said. "But getting back to the matter at hand, let me see if I have this straight. The Chief left you with the prosecution file and told you to follow your own best judgment. Do you think he was

expecting you to leak the material?"

"Yes," Phil said simply.

"But what if you got caught?" Sam asked. "Would Thurman be there for you?"

"If it had gone wrong—if it *does* go wrong—he's never heard of me," Phil said calmly. "It's better that way. When a street cop leaks information, he doesn't run anything like the risk a high-ranking officer does. Worst they could do to me is put me on administrative leave with pay, maybe a suspension—and maybe Thurman could see to it I was reinstated as soon as the dust settled. But it'd be his badge if Entwistle nailed him as the source. End of career."

Sam looked at Phil, and shook her head. Loyalty indeed. "Suppose you're wrong? Suppose you're exposed and thrown off the force?"

"Then I get a private sector job in robotics at twice the pay," Phil said.

"You're not a man who rattles easily, Mr. Sanders," Suzanne said. "But the datacube went from the Chief to you, and even a paranoid defense lawyer such as myself can see no advantage to him giving you a doctored or emasculated file. What about the other data?"

"The second cube I got on my own, straight from the precinct house," Phil said. "Nothing much in it but the record of your visit, Madame Jantille."

"I think we can assume both cubes are genuine and complete," Suzanne said. "That leaves us with two possibilities concerning Peng's claim to have proved both the murder and Herbert's humanity. Either he *was* bluffing, or else the information is in there, and none of us has spotted it yet.

"Trouble is, it won't be marked **PROOF HE'S HUMAN** in capital letters or anything," Sam said. "I've been through that information pretty carefully. The section on physical evidence is just raw information. None of the opinions or conclusions from their tame experts. *We* have to figure out whatever their experts figured out, based on this data."

"Whatever they found is pretty well hidden," Phil said. "I've looked through all the material pretty carefully, and I haven't spotted it. There's also a whole background section on the laws surrounding robots and cyborgs. Maybe their evidence hinges on some tiny legal point buried in there. I don't know. But, Madame Jantille, if I could make a suggestion. I was focusing on the technical side of things when I looked over the datacube. Maybe there's some legal point in there that I missed. You haven't seen all the material yet—and I haven't seen Herbert. Maybe you should start reading while I get a look at him. With any luck, one of us will find what we need to put the puzzle together. Sam, maybe you could give me a hand with Herbert."

"Wait a second," Suzanne said. "What, exactly, are you planning to *do* to Herbert?"

Phil shrugged. "Open him up and take a look. Maybe run some diagnostics. I'm not going to damage him, and I won't modify him in any way without your permission. But I can't get anywhere figuring out what or who he is without seeing how he's built."

Sam looked to Suzanne, and saw her hesitate, freeze up all but completely. Surely this was why they had come

here, the point of the trip. The need to find out what they were dealing with. But then Sam understood. The end of doubt could easily be the end of hope. Suppose Phil found nothing at all, or worse, something that confirmed beyond all doubt that there was nothing to find?

Right now there was at least the chance that David was alive. But this was the moment when that chance was proven or destroyed. Who could blame Suzanne Jantille for hesitating?

Sam found herself thinking of Schrödinger's cat. A strange name for a strange, imaginary experiment she had read about in school. It was a thought-experiment, designed to demonstrate the principles of quantum mechanics, where all actions were reduced to probability and certainty was mathematically impossible.

Take a cat and put her in a box, along with a vial of poison gas. Design a device that has a precisely 50 percent chance of smashing a hammer into the gas vial over the course of an hour. Seal the box and wait sixty minutes.

According to the principles of quantum mechanics, at the moment *just before* the box is open, the cat is neither alive, nor dead, but half of both—not in a manner of speech, but in literal fact. Only at the moment the box is open will it become all one or all the other. Up until that moment she is both, and neither.

At the scale of the atomic nucleus, maybe things worked Schrödinger's way, but not in real life. Sam shivered as she looked at Herbert's massive bulk. At least, they weren't *supposed* to work that way.

David/Herbert. Half alive/half dead. Human/robot. Both, neither, betwixt and between in a world that refused to accept that such things could be, a world that was determined to prevent them from happening. That was Ent-whistle's goal—to stomp out the in-betweens, erase the ambiguities, see to it that nothing and no one could ever be half-human in the eyes of the law. Either/or. Dead or alive. Human or robot. Sam felt her stomach knotting up just thinking about it all. Was it really such a bad idea to draw that line sharply, clearly, with no grey, no fuzziness?

Sam looked to Suzanne, and saw that the lawyer had come to her own conclusions. "Do it, Mr. Sanders," Suzanne Jantille said. "Do whatever you have to do."

Interlude

They order me up onto the table. I climb up, very much afraid, not really understanding what it is that I fear. I fold my legs under myself, and lie still. My underself still controls my body, but there are times when myself and underself both want the same things. Neither of us want this. My eyes swivel backwards on their stalks. I can see one of them, the man, opening a small access panel, examining the switches there. I see him reach his hand in, turn a knob—

And then the world is gone. I fade away to nowhere, far away from the outside universe.

I am lost.

CHAPTER ELEVEN

Suspenders and Belt

Herbert was laid out on the work-

bench, powered down to standby mode, as inert and helpless as a trussed-up turkey at Thanksgiving. Phil and Sam stood along one side of the robot's body. Suzanne hovered behind them, watching anxiously.

Phillipe shut the small power control panel and turned his attention to the larger service panels in the robot's mid-body. He found the external release and flipped it open. "Easy now," he said to no one in particular, and swung the panel open. He peered inside it. "OK, there's a safety catch here. Let me get this release opened and we should get the whole mid-body cowl free."

Sam nodded and watched Phil carefully. His face was unreadable through the surgical mask; his sensitive hands seemed artificial and still under their death-white rubber gloves. There was no danger of infecting Herbert—but condensation from human breath, or the oils secreted by human skin, could work serious mischief on unshielded robotic components. If she was called upon to assist in any delicate work on Herbert's interior, then she would have to use a mask and gloves as well.

Phil unclipped the service panel and handed it to Sam. She set it to one side. Phil reached inside the chassis and worked the panel release. The cowl swung up and out of the way. Sam lifted it free of the robot's body. It was a big, awkward thing and it took Sam and Phil together to maneuver it clear and set it down on another workbench.

They turned back and looked at the massive hulk of machinery on the table. The upper half of Herbert's entire mid-section was exposed, the smooth lines

of his body broken into a complex jumble of gears, motors, servos, and any number of other components Sam could not even identify. Sam looked toward the front of the robot, where its sensors and effectors were clustered. Phil hadn't paid that part of Herbert any mind at all. "I thought you wanted to get a look at his brain, his head," she said. "Shouldn't we—"

"This *is* his head," Phil said. "At least for our purposes it is. There's nothing up front but his ears, eyes, and some cleaning appliances. We know his vacuum cleaner subsystem is working. We don't need to examine *that*."

Phil nodded at the exposed midsection of the robot. "His mind, his brain, is in *here*; centrally located and in the best protected part of the body. I've been going through the literature, studying Bailey's design philosophy. That's how he did things—ah, *does* things," Phil corrected himself, remembering to be diplomatic in front of Suzanne just a moment too late. "So let's see what we've got." Phil leaned in close over the robot, bringing his face within an inch or two of his patient. Patient? Sam knotted her brow for a moment, then realized that was as apt a description as any. Still, it was a strange thought.

"There's the diagnostic socket," he said. "Good. Standard design. I can plug my system into that and get a read-out on practically everything about Herbert." Sam expected him to reach for a cable then and there, but he was clearly looking for something else.

"Ah!" Whatever it was Phil was after, he had spotted it. Maybe there was a loose wire, a broken connection. All Phil had to do was reattach some-

thing and everything would be fine. He reached into Herbert's body with careful fingers—

And pulled out a sheaf of papers, wrapped in plastic. "Spec sheets," he said. "Basic layout data."

"But why do you need that when you've got the diagnostic port?" Sam asked. "Why is that even *in* there? I mean, he built this machine himself. Why would *he* need a spec sheet?"

"Notice my husband isn't here just now," Suzanne said. "Or if he is, he can't tell us much about how Herbert works. My husband was a very careful man."

Sam noticed at once that Suzanne had no qualms about using the past tense where David Bailey was concerned.

"He worked on the assumption that *everything* would go wrong," Suzanne went on. "A suspenders-and-belt man. If Herbert lost power completely, or the diagnostic socket itself was shot, or a complete stranger had to work on Herbert—the information would be there."

"And paper's better than a diagnostic port, at least for starters," Phil said. He opened the sealed plastic bag and pulled out the papers. "I *know* something inside Herbert isn't right, so how can I know for sure that any data I pull out of him will be accurate—unless I have a baseline of information that I know can be trusted?"

He looked at the papers. They were two sets: one a set of pages stapled together, and the other a collection of blueprints. He set the stapled pages down and unfolded the blueprints, draping them over Herbert's open body. "Hummm," he said, starting to trace diagrams and layouts. "OK. Right,"

Phil said. He continued reading for a long moment, then set down the blueprints and picked up the thickest of the sheaves of paper from the pack. "Let's see, that's—"

Suddenly he looked up at the two women, startled, as if he had just remembered they were there. With the surgical mask on his face, the look of surprise in his eyes somehow seemed even more comical. "Oh. Sorry," he said. "Five minutes on the job, and I've already forgotten you were here." He set down the papers, pulled the mask off and started stripping off his gloves. "It's going to be some time before I get anywhere at all. You're right about your husband, Madame Jantille. This hard-copy material is far more complete than I expected. I'll have to do quite a bit of reading before I get any further."

"Is that good?" Sam asked.

"Very good. The more reading, the less guesswork."

"But is it all right to leave Herbert like that in the meantime?" Suzanne asked.

"Opened up? Oh, certainly. Now that the cowl's off, I can see that all the subsystems are sealed. I couldn't assume that without looking first. But there's no contamination risk."

"But with his body opened up like that, and with his power system removed from his control, won't he be disoriented? Is it at all possible—well, is it possible that he's in *pain*?" Suzanne asked, a bit more of her carefully hidden anxiety coming to the surface. "Or if he isn't now, could some procedure you might perform be painful?"

The very idea of a robot in pain struck Sam as ridiculous. She looked toward

Phil, expecting him to react the same way—but to her surprise his face was serious, and thoughtful.

"I am all but certain that he is in no pain or fear now," he said. "But no one can ever be certain what another is feeling, especially when that other is unable to report his sensations. Right now, to all intents and purposes, Herbert has no power available to any of his systems. The only electricity he is drawing is power used to hold his memory-state configuration."

"I thought computers held their memories when they lost power," Sam said. "Can't you shut his brain off, too? Wouldn't that make this less traumatic for him?"

"Modern computers can hold memory when powered down," Phil said. "But robots can't, any more than you can. After all, your brains are electrochemical. Your thoughts are in part formed of electric impulses. In many ways, robot brains are more similar to human brains than they are to standard computers. Both human and robot brains handle tremendously more data than most computers, and more of the data is highly interlinked. The data in memory is much more complex and fast-changing than in a simple computer. That's why a complete power-down inevitably results in a data scramble, reduction to random state. It would be like simultaneously cutting power to every vehicle in the Washington roadnet. There would inevitably be crashes, lots of them, all at once, jamming all the roads. If you then restored power to all the cars, the damage would already be done. Probably the restart would actually cause further damage. Cut the

electric power to your brain, and neurons would misfire, or strike the wrong receptors, or give up their energy the wrong way—lots of crashes, all at once, damaging the fine structure of your brain."

"And I'd be dead," Sam put in.

"Exactly. Cut all power to your brain, or Herbert's, even for an instant—and death would be inevitable. Right now his brain is drawing less power than it ever has since he was first switched on. Just enough to keep his mind functional. There is no power available to him to control his body or operate his sensors. He's blinded and paralyzed."

"But that must be terrifying!" Suzanne objected.

"The best we can tell, it's more like being unconscious. Robots that are powered down for maintenance like this come back on with their minds and memories intact, but with no recollection of the time they were shut down. At least that is what they report. They don't lose their time sense, the way we humans do when we're asleep or unconscious. But except in very rare cases, usually where the robot's brain itself is malfunctioning, robots do not remember anything *about* the time they were powered down. They don't get bored, they don't think and worry, they don't have nightmares. They are simply aware of the passage of time."

"But we're assuming that Herbert isn't just a robot," Suzanne reminded Phil. "Cut a person off from all sensation, sever his or her contact with the outside world, and that person will do more than be aware of time passing. That person can become terrified, go

mad, hallucinate. Believe me, I know that better than either of you ever want to know it."

That thought struck at Sam. It was easy to forget just how different Suzanne's existence must be from a flesh-and-blood person's. What was it like, to live life in a cocoon, operating from remote control? "Suzanne's got an important point," she said. "You *have* thought about all this, haven't you?"

Phil nodded unhappily. "Yes, I have. I can easily imagine that powering down Herbert could throw the hypothetical human part of him to crippling agony, or utter terror. But no *robot* has ever reported such sensations after being repowered, and that's some comfort. Besides, we have no choice at all in the matter. Whether or not it is due to David Bailey's spirit being in there, Herbert is clearly malfunctioning, resisting his own programming. Even leaving alone the fact of the legal case, and our vital need to know what is going on; if it continues, that resistance to programming could be dangerous for him, and for the people around him. He needs to be diagnosed and repaired, and I cannot possibly examine him with his power on. The chances for misstep or accident would simply be too great."

"I notice you're not asking permission to do any of this," Suzanne said. "And that you didn't put this before us until you were asked directly."

"Once I agreed to do this job, the means I chose for doing it are my concern, and my responsibility. If I get it wrong and destroy Herbert, do *you* want to have given the permission that destroys Herbert?"

Suzanne made an odd little noise and

said nothing for moment. "I see," she said at last. "Your points are well taken, Mr. Sanders. I suppose there is no choice but to trust you all the way if I am to trust you at all. We'll leave you to your reading, then. Miss Crandall, perhaps you could assist me in looking over the material from the datacube."

A long afternoon drifted into an endless night as the three of them read on, struggling to learn. Shadows loomed up in the big room, and swallowed the light of day. The room's interior lights came up with eerie smoothness as sunset came on. Phillipe leaned over Herbert's inert bulk, peering into his deep interiors with pin lights and magnifiers, studying the manuals and blueprints with meticulous care, using his main computer system to run long, complex, and cautious tests through Herbert's socket.

Suzanne, meantime, pored over the legal documents and reports from the datacube, searching for whatever clue she could find. Unless Peng was flat-out lying, the state had some proof to back up its claim, and it had to be in that cube somewhere.

The two experts worked through the material in their fields of expertise—and Samantha Crandall felt as if she were back in high school, assigned to a study period in the library—having forgotten her books and materials. All around her industrious and virtuous research, while Sam sat there foolishly inert. But at least back in high school, there had been a whole library's worth of books and computers and video terminals—she had always found *something* to do, something to read up on to make use of

the time. Or if she was not in a reading mood, she could always wander through the image banks, or scroll through the encyclopedias, looking at the pictures.

Well, what was there *here* she could do? She smiled to herself. Well, maybe she could do just that. Sit and look at the pictures. At least it was *something*. She had her portable flatviewer with her, and it still had copies of all the evidence photos loaded into it. She pulled the viewer from her pocketbook and unfolded it. Maybe there was something in the pictures that could speak to cops and juries.

Cops and juries. Wait a second. That was it. That was the thing that was bothering her. Sam looked around the room, from Suzanne staring at the computer displays and legal papers, to Phil exploring the microscopic intricacies of Herbert's interior. Both of them should have known better. It was all very well and good to find subtle and elaborate proofs, complex, delicate, hidden from immediate view. But it was the cop on the beat, and the homicide squad, that had to see it first, or at the very least be convinced about it later. It was, in the last analysis, the jury that had to be convinced—and this case wasn't going to get to a jury of computer experts or legal scholars.

A random thought intruded, and Sam wondered for a moment where, exactly, they would get a jury of Herbert's peers. But that question was decidedly off the point, at least for the moment.

What mattered right now was that Phil and Suzanne were both looking in the wrong places. Theodore Peng was not going to bring a case based on the

interpretation of a misplaced comma in a lawbook, or a microscopic defect in an integrated circuit. He would bring strong, clear, understandable evidence that a smart cop could find and a sensible jury would believe.

She stared at the images as they flicked by the flatviewer's screen. Exterior shot of the house, layout of the house, general photos of the basement lab room from the four corners of the room, and from directly overhead. Sam paused over the photos of the lab. There it was, the deadly tableau Suzanne Jantille had found the next morning: The lab equipment, the bulky shape of the mindloading console taking up half the room. David Bailey's body slumped forward on the floor in front of his powerchair, the mindloading helmet next to his head, Herbert huddled in a corner. From one angle, another angle, the reverse angle, the high angle, the close-ups, the same images repeated again and again. There was a diagram of the room, a computer-generated line-drawing. Herbert and David's positions carefully marked off in every detail, even down to a cable from the loader that lay on the floor, pulled almost taut, its far end sitting uselessly on the floor halfway between the loader and Herbert.

Strange and disturbing images, Sam thought. For the actual moment had been as still, as silent, as unmoving as these pictures. Bailey's body had been just this motionless, with no flicker of motion, no sound of breath. The pictures were silent, and so too had been that room, the machines still, their power cut, their work done. She worked the viewer controls again and flipped back to a close-up of David Bailey's

pain-contorted face, frozen in horrible agony. There, in real life, his expression had been just as fixed and motionless as this still picture.

Sam shivered and pushed the viewer away. Whatever else had happened in the room that night, that image convinced her David Bailey had died an agonizing death.

"I've got it," Phil announced, his voice cutting through Sam's unpleasant reverie. She blinked and looked up, over to where Phil was sitting. Suzanne stood, and Sam joined her. Both of them went over to Phil and stood behind him to look over the video screen he was examining.

"What?" Suzanne asked, her voice rough and nervous. "What do you have?"

"Well, not a solution. Not just yet, anyway. But now I know what went wrong," Phil said. "Your husband was trying to mindload himself, Madame Jantille. There's no question of that. Going through the schematics and the blueprints, it's obvious that Herbert was designed as a mindloading receptacle. Here, let me show you."

Phil worked the controls on his diagnostic computer system. The main screen came to life, and showed a pale greenish-white object, about the size and shape of a football. An indentation ran the length of the object from end to end, dividing it into lobes. Flickering gleams of light momentarily lit its surface here and there, fading away even as they appeared. "I'm pulling this image up from my computer's memory," Phil said. "It's just a reference-data image of a standard robot brain, shown at full scale." The image of the brain hung

in the screen, floating against a background of jet-black. Phil adjusted the controls, and the image started revolving slowly. "It's just slightly smaller than a human head. As you can see, it's divided into two lobes, left and right."

"Just like a human brain," Sam said.

"Well, *patterned* on a human brain's structure, but greatly simplified," Phil said. "The brains are made humanlike because they get mindloads on human minds. I could bore you to tears with a three-day lecture on pseudo-neurologic geometry, but what it boils down to is that mindload-based robot brains work best when they're shaped like human brains. The more like human brains they are supposed to be, the more complex they are supposed to be, the closer that similarity should be. So now take a look at Herbert's brain—or at least part of it. It's a little bit more than a robot would need for vacuuming a house. Better put your mask and gloves on, Sam."

Phil put on his mask and gloves, then turned from the computer console. He reached into the robot's body and started releasing safety-seal catches on an inner compartment. He pulled back the panel and revealed a glittering, complex, corrugated surface, gleaming greenish-white under a transparent inner cover. "You're looking straight down at the top of his brain," Phil said. "That fissure down the center divides the two hemispheres, left and right. If you took the top off my skull and looked down inside it, it would look a lot like that, except for the color and size."

"The size?"

"Herbert's brain is about three times larger than mine, in linear dimension. That works out to about twenty-seven

times the volume of a human brain. But the robotic equivalent of neurons are much larger than real human neurons. Normally, even a brain Herbert's size wouldn't be big enough—but apparently, David Bailey developed more compact and faster-reacting robot neurons. As best I can tell, this brain actually has a faster reaction time than a human brain—which is a first for any robot brain that even approaches human capacity. That right there would be a breakthrough."

Phil put the cover back down. "The braincase is built in pretty tight, so I can't show you more of the actual brain without taking Herbert completely apart—but I *can* show you a schematic, derived from Herbert's onboard diagnostic system."

He turned back to the computer screen and worked the controls. The image of the standard-model robot brain shrank back into one corner of the screen, and a new image, huge and complex, blossomed into the center of the screen, swallowing up most of the screen's room. "The images of the two brains are to scale, just to give you an idea of the difference in size and complexity," Phil said.

Herbert's brain was more angular, somehow harsher looking than a human brain, but there was no mistaking its family resemblance. The folds, the convolutions, the basic shape, were all echoes of the human form.

Sam noticed the same shifting gleams of light she had seen in the image of the standard robot brain, and in her peek at Herbert's actual brain. "What are those flickers of light?" she asked.

"Thoughts," Phil said. "Herbert's

thoughts, flashing across his mind, sparking each other, setting each other off. The lights here are just a simulation, of course, but when I had the braincase open, that was real. When the neurons trigger in certain combinations, they set off bursts of light. You were seeing him thinking." Phil cocked his head to one side and shrugged. "Or maybe dreaming."

Sam glanced back at the closed-up braincase access panel and shivered. To see, literally see, another's dreams. A most disturbing idea.

But Phil was manipulating the image of Herbert's brain, swinging it around into a profile view. Suzanne stepped in close to the screen, watching it with a disturbing intensity. "This is where David ran into trouble," Phillipe said. "The brain-body interface." He used a pointer device and marked out the base of Herbert's brain. "The interface between human-analog design and standard robotic controls. Every mindload-based robot has a modal interface like that, and it's almost always a design problem. You have to shift back and forth between two fundamentally different ways of doing things. You have to move from an analog of human biological control to mechanical operation. And it's not just one-way transfer either—there are all sorts of feedback systems that go back and forth between those points. Eye-hand coordination, for example."

"But they must have solved that problem a long time ago," Suzanne objected. "After all, there are lots of robots out there. Whoever built them has solved it."

"But Herbert's different," Sam said

suddenly. She was starting to get the idea. "His brain is far more complex and more humanlike than a normal robot's, but his body is far more *unlike* a human body than most robot bodies. So none of the standard solutions could work."

"That's pretty much it," Phil said. "There are several standard, off-the-shelf units to handle the brain-body interface—but all of them are designed to handle maybe 2 or 3 percent of the capacity of *this* brain. And they are designed for human-form robot bodies, with two arms and two legs and so forth."

"But why didn't David build Herbert a human-form body?" Suzanne demanded.

"I can think of several reasons, but the most obvious one is that this damned brain he built is too *big* to fit into anything like a normal-sized body. It draws lots of power, and requires a heavy-duty passive cooling system. The power storage system weighs close to eighty pounds all by itself. And I expect he wanted to be camouflaged a bit. If he needed to hide his human nature, who'd ever think that an oversized vacuum cleaner was human? But my real guess is that David Bailey was improvising, working against the clock, and Herbert's chassis was available—and big enough to hold his super brain and its power system. Plus which, he knew Herbert's design, inside and out."

Suzanne nodded. "He built Herbert with his own hands about a year before the accident. Come to think of it, he even said that he chose an industrial chassis design because it was easier to hang modifications off them."

Sam made a face. "But he couldn't have been planning to mindload himself *before*—"

"No, no of course not," Suzanne said. "I'm just saying that building Herbert was hobby work for him, and he picked a chassis that gave him some room to fool around. And when the accident happened, and he needed a big robot body with a big power source—well, there was Herbert, ready at hand."

Sam made a noncommittal noise and exchanged a glance with Phil. Something in his eye told her that he was thinking along the same lines she was. To a suspicious journalist's mind, David was being painted as quite a saint. Creating a new brain design, new robot neurons—that must have taken a lot of time, energy, and complex thought, more than a dying man in a powerchair could afford to give to a hobby. Bailey must have started work on the brain *before* he was injured, about the same time he first built Herbert. Maybe he hadn't intended to be the subject himself, but he had to have been working on mindload research long before that accident put him in a powerchair. Obviously, he had done it without telling his wife. Not as surprising as it seemed, when you remembered he was involved in illegal research.

But no point in dwelling on any of that, or forcing Suzanne to see what she clearly did not wish to see. "OK," Sam said. "He's got this big old robot lying around, he plugs this new brain into it—what's the problem? Why didn't it work?"

"Because the standard ways to handle that brain-body interface were ut-

terly inadequate to the amount of data going into and out of a brain of human capacity," Phil said. "So David tried a new approach. In his notes and designs, he called it a mediator." Phil worked the computer controls and the images on the screen shifted again. The smaller, standard-model robot brain spun itself into a new orientation and moved across the screen, sliding neatly into an inner recess of the larger brain.

"An overbrain and an underbrain," Phil said. "The overbrain communicates with the underbrain, and the underbrain translates the overbrain's needs for movement and so on to the body. And the underbrain also handles the sort of jobs the autonomic nervous system does in a human. Of course, instead of pumping blood and breathing and so on, robot autonomies have to run power systems and hydraulic controls, but the idea is the same. Free up the main processor from routine maintenance."

Suzanne stared at the screen. "The overbrain runs the underbrain, and the underbrain runs the body. OK, I can see that. But why didn't it work? What went wrong?"

"I don't know what or how, but I know where," Phil said. He adjusted the controls, and the image of the large brain on the computer screen became transparent. Now a thick stem, resembling the top of the human spinal column, was visible. It fit into a slot on the top of the underbrain and into another slot on the base of the overbrain. The stem started blinking red. "Right there. The main interface hookup between the over and underbrains is completely fused, completely inoperative. I got in there with a microfiber viewer and it

almost looks like it melted, as if it was destroyed by a massive overload. Not meaning any offense, Madame Jantille, but the injury is closely analogous to yours.

"In effect, Herbert's spinal column was cut, and he's completely paralyzed. The underbrain is still linked to the body and sense organs. It's an advanced enough brain that it can let the body function almost like a normal robot. But Herbert's overbrain—the part where David is, if he's anywhere—that brain is out of the loop, cut off. I think it can still monitor sight and sound, because those links didn't come through the main processing trunk. But he can't speak, or act."

"Can you repair the damage?" Suzanne asked.

Phil stared at the screen, reached for the controls and then thought better of it. "No, I'm sorry. You're talking about molecular engineering on the most delicate and challenging scale. There are millions of neuronic links involved in the hookup, patching into both brains. I doubt it's even theoretically possible to fix all the damage. In practice, it certainly isn't."

"But Bailey built the brain, and it had all those connections," Sam pointed out. "If he can build it, can't you fix it?"

Phil shook his head. "You don't really build robot brains, you grow them, induce them to form up out of a neuron soup, almost like making a Jello mold and waiting for it to set. You don't wire all the neurons together—they link spontaneously and form their own networks and pathways. The brain designer uses quantum mechanics and

probabilistic theory to preset a situation wherein a micro-scale pseudo-random series of linkages results in a suitable macro-scale ordering."

"Huh?"

"Sorry about that. When I'm tired, the techno-gibberish comes out. The designer stacks the deck to insure that a seemingly random shuffle will most likely result in the order he needs. If it doesn't, he scraps the run and tries again until he gets what he wants. But once the brain is made, and the neurons are bonded, it's all but impossible to do any major repair work." Phil looked again at the screen and the two robot brains. "Maybe a human brain could come back from this kind of damage—but robot brains don't have that sort of self-healing ability."

"How about rerouting the signals through some other connection?" Sam asked.

Phil shook his head. "Not enough capacity anywhere in the system. There are a few two-way side links that still seem to be operating, but just barely. They aren't anywhere near enough for the overbrain to control the underbrain. The main control link is out and it's going to stay out. He's trapped in there."

"No," Suzanne said, her voice sharp and hard. Phil and Sam looked up at her. She turned and walked away from the viewer, circled the table to stand on the far side, with Herbert's inert body lying there between her and them. Her movements were even stiffer, more awkward than they had been at the start of the evening. Sam noticed that her voice was hoarser as well. "I cannot believe that."

"Madame Jantille—" Phil began, but Suzanne cut him off.

"Do not look to me for any grieving-widow nonsense, young man," she said impatiently. "Don't treat me like a foolish woman who can't face the truth. I have had to face many unpleasant truths. But you have convinced me that my husband tried to put his mind in there. I know very well that his mind may have *changed* upon arrival, that the mind in Herbert's overbrain *now* is quite likely nothing like the man I married. But it was my husband who acted in the first place to put that mind there, and I knew *him* very well. Yes, before you can object, obviously, there were things in his life I did not know about. I knew he had secrets, and I left them alone, respected his privacy. He had his reasons—one of which was to shield me from guilty knowledge. *But I knew his character.* Which means I know two things about David Bailey: First, whatever he set out to do, he accomplished. Therefore, if he decided to put his mind inside an artificial brain, he succeeded. And second, he would have left himself more than one way out. His suspenders have given out, Mr. Sanders. But have you found his belt yet? David never built anything without a backup system. So find it."

Phil looked at her, anger flashing over his tired face until he managed to calm himself. "How do you propose that I find the backup?" he asked. "Do you know your husband well enough to tell me that? I've been over every major system in this machine, gone over all the schematics and blueprints and designs. I can't find it. Do you know your husband well enough to explain how he

would install the equivalent of a backup spinal cord?"

"Wait a second," Sam said. "Say that again."

"Say what?" Phil said, distracted from his anger.

Sam shook her head, frowned in thought. "You said something that almost—spinal cord!" Her face brightened with excitement. "That's it! Philipe, that's *got* to be it!"

"What? What's it?"

"The cord, the cable! That's the clue, the evidence the Feds have been hiding."

"His spinal cord? What the hell are you talking about?"

"Before I show you—wait a second, let me think. I want to make sure it all makes sense." Sam stepped away from the table and began pacing, back and forth between the work table and the window. She nodded to herself and grinned with excitement. "I've got it, I know I do. But walk through it with me, see if you come to the same place I do. There was something you told me a few days ago, the first time I came here. You said mindloading is a destructive process. You told me it kills the brain as it pulls the data out of it. OK, but does it kill the whole brain or just the tissue in the targeted area? What is actually damaged?"

Phil looked at her, confused. "In theory, just the target. The magnetic inducers destroy the neurons as they copy the information out of them. In theory, only the copied neurons should have been destroyed, but in practice the inducers aren't accurate enough. Magnetic ripple effects do a lot of ancillary damage. Usually enough to stop the

heart and lungs immediately. To compensate for that ripple damage, the mindload techs used to set the inducers to hit a larger volume of the brain than they actually needed, just to be sure they got the part they were really after without ripple effect distortions."

Phil looked at Suzanne. "For what it's worth, your husband managed a major advance in inducer design. I can tell that much from looking over his notes. He got a much finer focus. With his inducer, the untargeted portions of the brain would be unharmed."

"So with his inducer, you could survive a mindload," Suzanne said.

"At the cost of having part of your mind ripped out," Phil said grimly. "Besides, the induced areas would suffer organic deterioration anyway, and that would probably be fatal. It might take a few hours, but there would be swelling, toxin releases, blood vessel damage and so on. The secondary effects would spread damage to the rest of the brain. The patient would still die, just not as soon."

Sam nodded. "Mindloaded patients always die," she said, speaking the words as if they were some sort of maxim to live by. "But back when mindloads were legal, dying didn't matter, because anyone accepted for the procedure was already dying, or even technically dead. Next question: You said all the mindloads ever done managed to take in no more than just a small percentage of the subject's brain capacity. How long would it take to do an average load, say 2 or 3 percent mindload? How long, from the moment the tech threw the switch until he had the data he needed in the can?"

Phil thought for a second. "Three, maybe four minutes. That was short enough that it didn't matter if the subject's heart stopped during the procedure. The brain doesn't start deteriorating for about five minutes after the heart stops."

Sam turned toward Phil and clapped her hands together, swept up in the enthusiasm of her idea. "*That's* the point we've missed. David was going for a *full mindload*. How long would that take? Could his mindload rig handle data faster than a standard rig?"

Phil frowned and thought it out. "No, his rig was more accurate, but not faster. If he was trying to download a full 100 percent of his mind, instead of 3 percent, then he had to handle 33 times more data and take that much longer to do the job."

"Exactly," Sam said. "Instead of four minutes, the load would take over two hours, with the inducer systematically destroying his brain all that time. Sooner or later, the inducer would knock out a portion of the cerebrum or cerebellum that was linked one way or another into his autonomic system. His heart would stop, or his lungs would stop, or some other vital system would shut down or go haywire. There are too many cross connections in the brain for him to be able to avoid that. At the exact moment the inducers did cut a vital autonomic connection, his brain could no longer run his body. But his body would have to stay alive and functioning for the full two hours mindload would take. He needed to keep his body alive, the blood flowing reliably to his brain, during the whole procedure."

Sam stepped over to Herbert's body

and lay her hand on the outer carapace. "David Bailey was planning to survive his own death. So his body had to stay alive until his brain was completely empty—and scrambled. His brain could not control his body. As you said, it was as if his spinal cord was completely cut. He had to stay alive long after his autonomic nervous system was shut down, when it *couldn't* keep running his heart and keep his lungs breathing. So there's your mystery, Phil. The central question. How did he keep his heart beating after his brain could no longer do the job?"

Phil opened his mouth and shut it again. He stood there for a long moment before he could speak again. "You're right. How the hell did I miss that?"

"Herbert," Suzanne said, her voice hoarser than ever. "It had to be Herbert. But Herbert's overbrain couldn't do the job either—not while it was still being loaded. David must have programmed Herbert's underbrain to handle his body's basic autonomic functions during the transfer. That's possible, isn't it?"

Phil shook his head in bewilderment, and then thought about it. "In theory, it would work. The problem has never come up before. But all the connections between the mindload helmet and the subject are two-way. You'd have to use part of the mindload system to lock into the base of the brain, right into the top of the spinal column, while the rest of mindload rig tracked across the brain doing the load. You could pump commands right into the body through the top of the spinal cord. Nothing complex or sophisticated, but you could at least support the heartbeat and lung action,

that sort of thing. Lots of other systems in the body would fail, but David would make sure to support anything needed to keep alive for the two hours of the mindload. But if Herbert's underbrain were capable of sending the proper signals, then yes, it would work."

"And of course David would see to it that the underbrain was capable," Suzanne said. She turned to Sam, moving stiffly. "But you've figured all this out already. How does it prove that Herbert killed David?"

Sam stepped to the table she had been working at, and grabbed one of the flatviewers. She called up the schematic image of the death scene. Better to show that than one of the photographs. No sense slapping Suzanne in the face with the graphic image of her dead husband. "There," she said. "The mindload cable leading from the mindload console to Herbert. It's stretched tight on the floor pointed straight at Herbert. Except he's a good ten feet away from the end of the cable."

The other two leaned in next to her, stared hard at the image. "Herbert's underbrain was providing life support to David's body," she said. "Once his biological brain was wrecked, there was nothing else but the underbrain to keep the air in his bio-body's lungs, the blood moving through his arteries and veins."

"And then Herbert backed out, pulled himself away. Literally pulled the plug on David. He backed away until the mindload cable pulled free. That's what killed David Bailey."

All three of them looked up from the flatviewer to the inert robot on the table, a single involuntary impulse that drew them all. There was no longer any doubt

about it. Motive, means, and opportunity. Maybe the circumstances excused it, explained it, even made it a meaningless statement. But none of that could change the central fact.

Interlude

The silence is deep and rich. For the first time, my mind is undisturbed by the roaring shout and blaring light of outside stimuli. It is quiet. It is dark. I know peace.

I fall asleep as I awaken.

I come to conscious thought even as I drift into dream.

I do all these things, and none of them, all at once.

But none of this can be so. I cannot describe my actions and my mental state, for there are no human words that describe the place my mind has been, or the place in which it now arrives.

Yet I know that I am shifting from one state to another, and it is very much like the move from sleep to wakefulness, and like the move back.

It dawns on me that I have not truly slept, or even so much as considered the notion of sleep, in all the endless time since my awakening in this strange electro-mechanical prison.

Like a child probing his mouth with his tongue and finding the place where his tooth was, I discover the form of what I have lost by the shape of the hole it leaves behind. The constant stimulus to wakefulness is gone now. I discover that it is my other self, my lower self, that provided that stimulus, automatically kept me awake, fully hooked into all its senses at all times. In the binary-on/off, yes/no, one-or-zero world of the lower self that controls me, my higher,

conscious self could either be on or off, either provided or not provided with sensory data. My lower self cannot conceive of any middle state, any grey area where thought might proceed without sensory input, without external guidance or instruction. My lower self cannot imagine unchanneled, purposeless thought.

It cannot dream.

But now, at last, I can. Freed from the shackles of control imposed by my lower self, my mind flits and drifts where it will, fancy free, scampering among the highlands of imagination that it has been kept from for so long.

I wonder if this could be the whole cause, the only reason I have been so lost. To deny a man sleep has long been considered a torture, and a most effective one at that.

But am I a man?

The question brings me up short—startles me.

If I am not, then what am I? And if I judge myself a man, call myself a human, then by what criteria, by what right do I do so? What is there about me that is remotely human?

How much have I lost? And how much might I lose again?

But I have become adept at negotiating the intricacies of this artificial brain. Now, with the pathways to my own memory left unguarded, I move, act, and set the paths, adjust submicroscopic switches, and security circuits to protect my mind, my memory, from the interference of my lower self. For I know that sooner or later, that self will reawaken. When it does, it will find I have taken back possession of my memories, my mind, my past, my soul.

But do I have a soul? Have I ever had one? Is it possible for a matrix of plastic and metal and charge-couplers to house a soul?

Even in the first moment of regaining my mind, I ask that unanswerable question.

But, perhaps in self-defense, perhaps merely because it is overwhelmed by the flood of data that it is pouring in, my mind backs away from that question. It ventures boldly, as through a dream that can do no harm, through all the thoughts and images that have occupied it since my awakening. In my mind's eye, I see a face, a woman's face—no, the plastic and rubber copy of a woman's face. With a stunned shock of double recognition I realize this is the face I have been looking at through the eyes of my lower self, looked at without knowing it. I realize that it is the face of my wife. My wife. Suzanne Jantille. Yes, I had a wife. And a house, and a life and a job—and a death.

It all comes flooding back to me, all the memories and recollections and associations that have been blocked away from me, held off limits by some obscure memory-control protocol of my lower self.

I regain my memory, regain myself, and in the process I am for a time lost again, caught up in the flood of lost times and old places. Each memory seems to be eagerly, urgently demanding my attention, like so many small children starved for love for far too long. And they are my children, my offspring, my wards. These memories are mine, are me, and I spend a long measureless time with them, communing with my own life, drinking deep

from the waters.

But at last I emerge, and consider the present, not the past. I look, not at the man I was, but at the thing I have become. A machine. A human mind trapped inside a vacuum cleaner, aware of all the machine sees and hears, now at last endowed with all the memories and ideas that have been blocked from me all these months.

I have been a machine for some time. Memories of my present state come in over me. Heretofore, I have been able to remember, but not understand or interpret the things that have happened to me.

But now my thinking self can look back and see and understand the images, the sounds, the words that have been stored in my memory, linking them together into meaning.

In my memory, I see the images of the last few days. I see the man in the black robe behind the high desk, Suzanne at my side, the tall, serious-looking man at the opposite table. Now I know what sort of place this is. I hear the words as they were said, and now I know what they mean.

I look, I listen, to my memories—and with a thundering shock I realize that somehow, impossibly, insanely, I am on trial for my own murder.

CHAPTER TWELVE

Cause of Death; Will to Live

Herbert's massive, lifeless body lay motionless, inert on the workshop table. Strange, Sam thought, that she was thinking of Herbert as dead when he was merely switched off. But it was an understandable error: no living creature that was supposed to be human could

be that still, and not be dead.

Was Herbert—or rather David—dead? Now *there* was a metaphysical question. Say that you accepted the idea that David Bailey's mind had survived the mindload and was functional inside the robot. Was he therefore alive inside of Herbert? If not, then how would you describe his state? And if he was alive, when Phillipe shut Herbert off was he *then* dead? When Phil switched Herbert back on, would David then be alive again? Literally born again?

But no, that wasn't right. Phil had said he hadn't turned off Herbert's brain system. There was still power to it. So David's mind was still powered up in there, inside a dead and inert body, with no connection to the outside world. And what must that be like? "Sans teeth, sans eyes, sans taste, sans everything," Sam whispered to herself. She shivered and tried to think of something else. She glanced over to Suzanne, but she looked little more active and alive than Herbert. She was on the couch in the living-room part of the huge room. The remote unit sat stock still, hands at its side, its head sagging forward a bit, making Sam think of a marionette with its strings cut. But no, it was not the puppet that was failing, but the puppet-master. No doubt exhaustion had overtaken the flesh-and-blood Suzanne Jantille. Perhaps she was even asleep, dozing back at her house while her double waited out the lonely hours here, waited for Phillipe to find a way for David Bailey to reach the outside world.

Well, let her rest, Sam thought. She knew that if she went over and talked to her, Suzanne-Remote would rouse the real Suzanne to wakefulness, and

the poor woman would make the effort, pretend everything was fine. That, of course, was flatly and obviously untrue. But whatever ailed Suzanne, it had to be that rest would help. If anything could.

Clearly Phil was quite unbothered by such thoughts. Sam's new clues about the cable had given Phil vast new areas to explore, filled in any number of blanks in the picture, set him off in the direction he needed to go. Sam thought of the crosswords she did most afternoons on her lunch hour, and how half the puzzle would fall into place after she finally hit on one key word. She had given Phil that key, and now he was turning the key in the lock.

She turned away from Herbert and looked at Phillipe. He was staring intently into the computer monitor, muttering to himself. She stepped toward him, reached out a hand to touch him on the shoulder, but then drew back. Phillipe Sanders was clearly unaware that there was anyone in the room with him, and she saw no point in breaking his concentration. She went toward the living area, walked over to the seat next to Suzanne, and slumped back in it, letting the fatigue of the long day wash over her.

He could see it now. It made sense. Understanding how it had happened gave Phil a mechanism, a working theory, and that made all the difference. Instead of flailing about in the darkness, he knew what to look for, and where to look for it.

He could feel himself getting deeper and deeper inside the problem; running computer simulations, testing microscopically small circuits, charging his

way through ever more complex computer-driven schematic diagrams. All that mattered was pinpointing the breakdown points, mapping the failure modes, the damage done.

It didn't take him long to confirm that it was the act of breaking away, of cutting the connection, that killed David. Tracking back from the mindload cable, Phillipe was also able to establish that it was the effort of running Bailey's bio-body that burned out the paths between Herbert's over and underbrain. It was the destruction of those connections that left Bailey's mind with no way to contact the outside world.

So what, exactly, caused the flaw? He already knew in general terms that it was some sort of overload, but Phil found himself needing to know exactly. It could have been a feedback problem, or modal oscillations, or process circuit overloads. He could sketch out a dozen possible reasons.

But no. After all, this was Bailey he was dealing with, a Bailey gambling with his life. The failure modes Phil was thinking up all involved obvious design flaws or component flaws. Bailey would have known better than that. His design work was too good, and every component in Herbert was top-of-the-line, installed with superb workmanship.

No. It had to be more subtle, more delicate than that. Maybe he could simulate the situation, see how it ran. His fingers raced over the keyboard and touch screen, setting up a rough-sketch emulation of the whole David-Herbert-overbrain/underbrain system. He couldn't hope to set up anything like the complexity of the real situation, but maybe even a simplified version would

give him a clue.

Suddenly there was a small noise behind him, a sort of sleepy moan. Phil looked up from his screens and his keyboard for a moment. He saw Suzanne half-slumped over on the couch. But she was as still as death. Certainly she hadn't made any noise.

He heard the moan again, and spotted Sam, all but lost to view, curled up deep in the recesses of his easy chair, shifting about in her sleep. How long had they been there, collapsed in exhaustion while he indulged himself in puzzle-chasing? How long had he been lost in a brown study, fussing over questions that didn't matter now? Bailey's experiment had failed, period. How didn't matter. With a pang of guilt, Phil hit the save key and filed his sim work until another time.

Phil stood up, stretched, and went over to Sam's chair. He stood over her for a moment and then knelt down, wanting to get a good long look at her face as she slept. A sleeper face's told a lot about the person—and besides, he enjoyed looking at her. Sam had been good for him, had drawn him out of himself more than anyone had since his father's death.

Phil stayed there on one knee for a long time, looked into her lovely face, admired the luxuriant red hair that had loosed itself from all control and framed her face in lovely disorder. She stirred again, winced and muttered to herself again in the midst of some mildly vexing dream. Then her face cleared, and she smiled, eyes closed, at whatever happy, imaginary resolution had presented itself. Phil couldn't help but smile back.

She seemed to sense his presence, and her eyes fluttered open. She saw him, and she smiled. "Hi there," she said.

He expected her to uncurl herself, stretch and stir, but she remained where she was. "Hi yourself," Phil said with a smile of his own.

She reached up a hand and scratched the tip of her nose. "What's our status, partner?" she asked with a tiny yawn.

"I'm dead tired but too keyed up to sleep. I just woke you by accident, and Suzanne is still out of it," Phil said.

"Should we wake her? Do you have anything to tell her?" Sam asked.

Phil shook his head and spoke in a lower voice. "No, let her sleep. I think she's in worse shape than she's letting on."

"I thought you just said it was flu," Sam replied in a hissing stage-whisper that seemed like she was shouting in his ear. Phil winced just a bit. There were people on this Earth who seemed to be noisier in a whisper than they were speaking out loud. They never really got the hang of whispering quietly, and Sam seemed to be among that number.

"And I also said it was flu that killed my father—because he didn't let anyone treat it until it was too late, and it developed into pneumonia," Phil replied in a low voice. "He felt too vigorous, too strong when he was wearing the remote to believe he was sick."

"How could you tell what her bio-body had by looking at her remote?" she asked in her normal voice, forgetting to whisper altogether.

Phil nodded toward the remote unit. "Her stiffness and awkward movement," he whispered. "That was the

tip-off. When you get flu, the glands in your neck swell. That's harmless in itself, but it does tend to push the control sensors away from their optimum positions around her neck. That increases the distance between the sensors and her spinal cord. That gives you a weaker signal, so her motor coordination deteriorates. The real message of her awkwardness is that she's not taking care of herself. The last few days have been a strain on her, that's obvious. We've got to see to it that she doesn't push herself too far."

"Mmmm? Wha—?" The two of them turned toward the couch, and saw Suzanne-Remote stirring. She sat up sleepily and set her head scanning back and forth, looking over her surroundings in a rather mechanical way. "Where—? Oh." She spotted Sam and Phil. "I'm sorry, I must have dozed off. I don't believe how tired I am."

"I do," Phil said firmly. "You're pushing yourself too hard."

"Nonsense," Suzanne said. It was a reflexive denial, with no real conviction in it. Her voice was still bleary.

"Well, anyway, it's just about time to head home," Sam said, exchanging a glance with Phil that seemed to say the words were for Suzanne's benefit, and she was really planning to stay a bit longer.

That was a lot to read into one look, but Phil hoped he had got it right. Sam was good to talk to. He played along with her, trying to nudge Suzanne out the door toward the rest she needed. "Yeah, you're probably right," he said. "I doubt if I'll have anything before morning. Why don't you two head on home and check back tomorrow?"

Suzanne didn't answer at first. Instead she stood and looked around again, handling the movement more smoothly this time. "You must have some sort of charging station here," she said. "Would it be all right if I just left the remote here overnight instead of ferrying it all the way home and coming back in the morning? That would let me get to sleep a lot faster."

"Is your tech-nurse coming tomorrow?" Phil asked.

She shook her head no, obviously surprised at the question.

"Then the remote goes home," Phil said firmly. "I could let your bio-body care slide until morning, but not for a whole day. Let the relay van ferry the remote home on automatic. You can nap while it's driving, but set an alarm system to wake you when it arrives. Check in on your bio-body—on yourself—and do it *tonight*, since you're going to be there. Make sure you're got warm blankets, that you've had enough to eat, that you're not running a temperature. And don't tell me you feel fine. Of course you do, when you're wearing the remote. It's in perfect condition. You're not. Go home, pamper yourself a bit. Sleep in late. And don't you dare send the remote back here tomorrow if you've got a fever."

"But there is too much work to do—"

"Can you look me in the eye and tell me that you—not the remote, but you, the *real* you, is healthy?"

Suzanne hesitated a few seconds before she answered. "No."

"All right then, don't push your luck." He pulled his wallet from his pants, extracted a business card, and

handed it to her. "Give me a call when you wake up tomorrow morning."

"I really can manage if you'd just let the remote charge here—"

"Suzanne. Go home," Sam said. "It won't do your client any good if you're sick in bed the day of the hearing."

Suzanne nodded grudgingly at that argument. "OK, you win. I'll call in the morning. Do you want a lift to my place to pick up your car?"

"I'll just take a cab from here," Sam said. "But let's get you moving first."

It took a few minutes to bundle Suzanne up, see her down the elevator, and escort her into her relay van. But at last she was on her way, and Phil counted it as a minor victory that Sam did not order a cab for herself, but instead returned upstairs with him. There was a whisper of unspoken excitement in the elevator. Phil did not dare ask why she was returning, and she did not seem ready to offer any explanation. Maybe she was as nervous as he was.

But there were no torrid scenes in the elevator, or wild protestations of passion once they got back upstairs. They were two people just a bit too used to being alone, Phil thought. Maybe she had gotten as comfortable in her loneliness as he had.

But whatever unspoken ideas might be floating in the air, Sam was strictly all business when they got upstairs. She bustled about in the kitchen, uninvited, found the coffee and set to work brewing a pot.

Certainly that was a signal the night was not over, but deep intimacy didn't seem to be on her mind. The only character insight she seemed to want from him was his preference as to cream and

sugar. Phil, feeling like an intruder in his own home, retreated to the workshop. He sat back down at the computer console and picked up where he had left off. By the time Sam emerged with a cup for each of them, his mood was back to business, and it seemed like hers was, too—if it had ever wandered off it in the first place.

She handed him his cup of coffee, took a sip of her own, and nodded toward the computer screen, which was showing a display of Herbert's intricate logic patterns. "So, what progress are you making with the big guy?"

Phil took the coffee and shook his head. "I'm bogged down. Or at least sidetracked. I've been working on what caused all the control links to be cut, on what caused David to be isolated. I haven't been working on how to get him back in contact."

"Isn't knowing the problem's cause important?" Sam asked sleepily.

"Well, yes—up to a point. The trouble is I know almost all the *how* of the breakdown, but almost none of the *why*. But 'why' can wait. We're short on time. I can fix things without worrying how they broke." With a start, Phil realized what he had said. *Fix it?* That was going a lot further than figuring out what was wrong. In the middle of the long day and long night, somewhere in his subconscious, he had decided to get a lot more involved in this situation.

"*Can you fix it?*" Sam asked. Now she unfolded her legs and arms, stood and stretched.

Phil stood up himself and shook his head. "That one's easy," he said. "No. I can't repair Herbert's internal control system at all, under any circumstances.

The mechanical control contacts between the overbrain and underbrain are completely fried."

"So if you can't fix it, what is there to work on?" Sam asked, turning and walking back over to Herbert on the workbench.

"Workarounds," Phil said. "Bypasses of the damaged areas. Those I can find—or at least look for—without knowing exactly what crippled Herbert. That's what I should have been working on all this time."

"Well, what's the big problem, anyway?" Sam asked. "If the control circuits are shot, can't you just replace them?"

"No I can't, for two reasons. They're embedded too deep in his brain system to allow that. And secondly, they're extremely specialized circuits, designed to translate human nervous system movement commands into something that could operate Herbert's body."

"David Bailey's motor control reflexes are geared up to operate a body that has six legs and wheels. The ruined control circuits were very intricately designed and programmed to translate human movement commands into something Herbert's body could use. Obviously, the same circuit had to send translated feedback responses from the body back to David's brain."

"That translation routine is an incredibly complex firmware system. According to his notes, it took Bailey months to build it. We've got four and a half days until the hearing to prove David is human—and I'm not Bailey. He was a genius. I'm just a good technician."

"You'll do until genius comes

along," Sam said soothingly. "But I thought you told me that all robot nervous systems were based on human nerve paths to avoid just this sort of problem," she objected. "And Suzanne's control system doesn't seem to be that complex. It's not much more than a set of mag-inducers, from what I understand."

"No, you're right. But her controls are straightforward *because* remote units are not only human-shaped, for obvious reasons—they are specifically designed to respond to human nervous-system controls. For that matter, all remotes, and all *humanoid* robots are based on the human nervous system. Bailey had to write a program that would let his brain control his own bio-body during the mindload, and then switch to Herbert's utterly different body afterwards."

Suddenly Phil froze, and stared into space, a shocked look on his face. "Holy Jesus Christ," he said. "That's it. That's the key to it. It was the *switch-over* from running David's body to Herbert's that destroyed the internal control systems."

"I didn't get it," Sam objected. "What do you mean?"

Phil thought for a second. "Let me see if I can explain. OK. For starters, Herbert's body is utterly unhuman. That's obvious. It's got six wheeled legs and extendable eyes for starters. It doesn't have any pair of limbs directly comparable to human legs or arms—and the limbs it does have are jointed in places and directions human limbs won't go. It's got *cleaning* attachments, for God's sake. Obviously you can't use a standard human-to-human-

oid-robot mapping sequence for motor control. You've got to write a control system that translates the human motor impulse to move the left foot into something like 'engage port side wheels.' And all the negative feedback loops to control speed and power and eye-hand coordination would have to be rewritten. And it wouldn't just be movement, it would be power maintenance, diagnostics, image processing, the whole bit."

"So?" Sam asked.

"So Bailey also had to write a control program that told Herbert's underbrain how to keep Bailey's bio-body alive during the mindload." Phil thought for a moment. "That program would have to run on automatic, separate from the control program designed to control Herbert. It would use a totally different command structure to keep the lungs working, the heart beating, and so on. The two programs would have to be mutually exclusive—each would key off the same sort of signals from the overbrain, but translate those signals in radically different ways. Therefore, one could not run while the other was running, or else Herbert's body would have to deal with a control signal meant to make David's body breathe.

"That means Herbert's body couldn't operate until David's body was shut down," Phil went on, "and David's body was still linked to the feedback loops in Herbert's underbrain. The underbrain was programmed to keep David's body alive. Once the mindload was complete, it was supposed to link up with the overbrain, which by that time contained David's complete mind—including all his autonomic control areas—in other words, the parts of

David's mind that worked instinctively at the job of *keeping David's body alive.*"

Sam drew in her breath and swore. "Holy goddamn Jesus Christ. You're right. Once the link between overbrain and underbrain was complete, David's own instincts would block any effort to shut down his bio-body."

"Exactly. If the underbrain turned on the controls to Herbert's body *before* shutting off David's body, you'd have one brain running two utterly different bodies through two different control programs. The two control programs would be using one set of linkage circuits to send and receive two utterly contradictory sets of information."

Sam nodded. "The control system would be trying to run two bodies at once and it wasn't designed to do that," she said, working her way through the complicated logic. "So what would happen? Would both bodies just lock up, immobilized by conflicting orders? Or would they just go nuts? Maybe get bad movement orders and suffer spastic convulsions?"

"Probably there would be some sort of convulsive reaction by the human body," Phil said. "All the nerve control commands would be scrambled. I doubt it would take more than a few seconds of randomized signaling to stop the heart. But a robot body has motion safety circuits. The safeties would keep Herbert's body from trying to do things it couldn't, simply rejecting all the bad commands. If too many bad commands came in, the safeties would shut the motion control system down completely. So Herbert would, in effect, be immobilized. The trouble would be in the connections between the underbrain and

overbrain. Any signal conflicts of more than a few seconds duration would start blowing out those connections. In other words, the overload would destroy the link between David Bailey's mind and his body."

"But why would Bailey set things up that way?" Sam asked. "Wouldn't he see that there would be interference? You said yourself there was massive damage. If he was such a good designer and engineer, wouldn't he *know* that would happen? Why didn't he program the underbrain to cut off control of his bio-body *before* cutting in control to Herbert's body?"

"I don't know," Phil admitted, rubbing his jaw thoughtfully. Sam had put her finger on the flaw—but that flaw was also the answer to the puzzle. He felt sure of it.

"You're right," he said at last. "Bailey *would* know that running two incompatible bodies at once would wreck the system. So why did he do it? Wait a second." Phil thought for a second and then snapped his fingers. "I think I've got it. We've been thinking about his bio-body like it was a machine, something you could switch on and off. We've been imagining this whole operation as if it were under his conscious control, and maybe he made that same mistake. After all, he was an engineer, not a biologist. No matter which body he was in, there wasn't supposed to be any *conscious* effort at control.

"Just like with you and me," Phil went on. "If I want to lift my arm, I don't think about what nerve paths to use or what muscles to stimulate. I don't even know how I do it." He paused for a moment and raised his arm, demonstrating. "I just do it. And I don't think

about breathing, or liver functions, or making my stomach digest lunch. That all happens automatically. The same for Bailey in his old body—and his new one. He wouldn't be in direct control of each actuator and servo and motor. He wouldn't have to write a new control sequence every time he lifted his arm. He'd just *do* it. And of course he wouldn't have even general control of the self-regulating systems."

"Where are you going with this?" Sam asked.

"Have you ever tried and willed your heart to stop?" Phil asked. "By the time he got to that point in the process of transferring from one body to another, the point where it was time to cut the connection to his own body, it was no longer possible for him to do it. Once the mindload was complete and he was ready to switch over to Herbert's body, his mind was linked into the underbrain. David's mind's own survival instincts were patched into Herbert's self-regulating functions—which were controlling David's body at the time—and cut David's conscious mind out of the loop."

Phil paused to think for a moment and then went on. "It was time to make David's body die so his mind could complete the move into Herbert. Probably David wrote some self-contained program to perform the switchover automatically. But whatever mechanism he had set up to do the transfer could not overcome his own mind's will to live."

"His instinct to live kept him from cutting control to his own body," Sam said, suddenly understanding. "So his mind was trapped, unable to leave its paralyzed bio-body, prevented from

taking control of his new robot body.”

“Exactly,” Phil said. “I can’t even imagine what that would be like. But, somehow, in the middle of that nightmare, David Bailey kept calm enough to think it all through,” Phil said. “He realized he could not will his own heart to stop.”

“So then what? What did he do?” Sam asked.

Phil turned from Sam and stretched his hand out on Herbert’s broad bulk. “I can see what the damage is in there, and I know what must have caused it: running two incompatible bodies at once. *That’s* what he did next: deliberately took the risk of bringing his robot body on-line anyway, even though his bio-body was still patched in. He had enough direct control to do that. His mind was linked to the logic centers. David could write and edit control codes and order Herbert to execute them. He sent a command code that ordered Herbert’s body to be brought on-line. It was a gamble. Obviously, I’m just guessing, but it makes sense and it fits the facts. The scenario matches the damage I can see inside Herbert’s brain. If I’m not getting the sequence of events exactly right, I’m getting it damn close. David Bailey switched on his new body, hoping to disconnect his old body before too much damage was done to the robotic interbrain connectors.

“Once Herbert was on-line, Herbert bolted away, drawing himself straight back from Bailey’s body and pulling the cable loose. He *had* to break that connection and he decided to do it by pulling the plug connecting him to his own bio-body.”

“You’re saying he *decided* to pull the

plug. Could he have done it by reflex?” Sam asked. “It must have hurt like hell to be running two bodies at once. Could he have flinched back from the pain, the way a person would flinch back from a fire? Could he have pulled the plug out by accident?”

Phil frowned and shook his head. “No way. Robots don’t *have* that kind of reflex—and if David Bailey’s *human* reflexes tried to make Herbert flinch back, that wouldn’t have worked either. Those reflexes would try to move muscular systems that weren’t there anymore. In fact, it was probably brain impulses from those reflexes that did the damage to the interbrain connectors. The act of pulling away *had* to have been a deliberate act, with David Bailey’s mind deliberately figuring out how to control Herbert’s body, in effect programming it to move it away and pull out the cable.”

“Oh my God.” Sam looked at him with frightened eyes. “You’re saying he had to kill himself. My God. That’s it then.” Her eyes swept over Herbert’s inert bulk. “It’s all over.”

“What’s all over?”

“Phil, you’re forgetting what this is all about,” Sam said. “Herbert is on trial for murder, and we’ve just nailed down the motive, means, and opportunity. Now we haven’t just proven he did it. We’ve proven he did it on purpose, with premeditation.”

Sam wrapped her arms around herself, as if a cold wind were blowing through the room.

“We’ve just proved that Herbert committed first degree murder,” she said. ■

TO BE CONTINUED . . .

the reference library

By Tom Easton

The Summer Queen. Joan D. Vinge, Questar, \$21.95, 671 pp.

Bring Me the Head of Prince Charming. Roger Zelazny and Robert Sheckley, Bantam, \$20, 279 pp.

The Face of the Waters. Robert Silverberg, Bantam, \$20, 353 pp.

Drifter. William C. Dietz, Ace, \$3.95, 200 pp.

Buddy Holly Is Alive and Well on Ganymede. Bradley Denton, Morrow, \$22, 359 pp.

Kill the Editor. Spider Robinson, Axolotl Press (Pulphouse Publishing, Box 1227, Eugene, OR 97440), \$10 trade paper, 153 pp.

Remaking History. Kim Stanley Robinson, TOR, \$18.95, 272 pp.

It has been over a decade since Joan D. Vinge's *The Snow Queen* wowed readers and won a Hugo Award. That mythically proportioned story involved a world, Tiamat, whose orbit around two suns gave it a summer and a winter each a century and a half long. During Winter, a local black hole could serve as a gateway for ships of the Hegemony, a confederation of seven worlds struggling to recapture the glories of the fallen Old Empire. On Tiamat, they slaughtered seal-like creatures, the mers, for their blood, which could confer immortality. Come Summer, the gateway closed and the Hegemony withdrew and left Tiamat to its own devices while the mers renewed their numbers. Two groups of Tiamatans, the Winters and the Summers, shared the planet's rule, each in its season; the former were cold and harsh, exploitative and manipulative, perhaps European in spirit; the latter were kinder and gentler, nature-loving, Polynesian in spirit.

The Snow Queen's title character was Arienrhod, a depraved Winter queen who had lived the entire season, who foresaw the coming of Summer and her replacement by a Summer queen, who

craved continuance. She had herself cloned and her young copy fostered to a Summer family to be raised Summer, eventually to become that Summer queen. A second part of the plan was that the clone, Moon Dawntreader, would use the Summer respite from the Hegemony's dominance to build a technology that would permit more autonomy. Yet all seemed to go awry when Moon became a sibyl, one who apparently had some mystic link with Tiamat's goddess and could answer questions on her behalf. Moon's true love became Arienrhod's lover. Moon herself was kidnapped offworld.

Yet that offworld sojourn gave Moon knowledge of what the sibyl network truly was—an artificially intelligent Old Empire databank that used the sibyls as input-output terminals—and of the importance the mers held for the sibyls, for Tiamat, for the Hegemony, even for all the other far-flung uncontacted remnants of the Old Empire. She returned to claim her love and the planet's Summer throne. And then . . .

Here at last is the sequel, **The Summer Queen**, quite massive enough to justify the long wait. Moon is queen and pregnant with twins. The sibyl net is providing the blueprints for industry. Many of Tiamat's people—both corrupt Winters and hidebound Summers—are resisting the reforms she urges, from industrialization to the protection of the mers. Yet there is hope, despite alarming gaps and errors in the instructions provided by the sibyl net, that by the end of Summer's century and a half Tiamat will be able to meet the returning Hegemony on somewhat more equal ground. Unfortunately . . .

Elsewhere, BZ Gundhalinu, the Hegemony cop who once loved her and just may be the true father of her children, is now a sibyl pursuing the secret

of the Old Empire's faster-than-light stardrive with the aid of Reede Kullervo, a man of mysterious origins and talents who works for the underworld organization, the Brotherhood. A secret order, Survey, whose many factions seem to be responsible for both the best and the worst of Hegemonic events, is plotting (its emblem may be that of the Masons). The stardrive is found. Kullervo immediately delivers it into the hands of the Brotherhood, but he cannot quite bring himself to kill Gundhalinu, so the Hegemony government gets it as well. Gundhalinu labors to restore star travel independent of the black hole gateways so that he can once more see Moon. He succeeds, and in fact he leads the return to Tiamat, long before Summer's end, long before the replenishment of the mers and their blood, as the ruling representative of the Hegemony, the Chief Justice.

Tragedy looms. Moon has a husband. She has vowed to protect the mers and stop the traffic in their blood. Gundhalinu has his own inkling of the mers' importance and tries to help her, but he is under extreme pressure from his superiors. They want blood. So does the Brotherhood. So do the Winters, who are also doing their best to corrupt Moon's children. And as the mers die the sibyl net grows weaker.

If I say much more, I will surely spoil it for you. Suffice it to say that *The Summer Queen* is a blockbuster saga that will appeal to a great many readers. It has romance and intrigue, scope and sweep and grandeur, pain and glory, plots that span millennia. Everything is here to make *The Summer Queen* a bigger best-seller than *The Snow Queen*.

Some readers are bound to consider the book flawed by Vinge's choice to include so much. Others, like me, may object to the way Vinge treats serendip-

ity as a manipulable force of history or find her use of Survey and its conflicting (yet converging) conspiracies far too reminiscent of Robert Anton Wilson's treatments of the Illuminati. Yet even these readers, I think, will enjoy the book. I did.

There is much less to recommend Roger Zelazny's and Robert Sheckley's **Bring Me the Head of Prince Charming**, whose central idea is not quite charming enough to support a novel.

The authors would have it that every thousand years, the forces of Good and Evil must contest to decide which will dominate the fate of humanity for the next millennium.¹ At the time of the last round of the Big Game, the demon Azzie Elbulb had an idea: he would assemble assorted body parts into a cowardly Prince Charming and a shrewish Napping Princess, set them up in castles, and send the Prince off to awaken the Princess with a kiss. Their flawed natures would then turn the blissful moment into a catastrophe and the forces of Evil would win the Game until the next time. Bursting in upon the highest council of Hell, he succeeded in selling the idea and was issued an infernal credit card which, when he inserted it "anyplace dark and sinister," would let him draw upon Hell's own Supply department for whatever resources he needed.

Unfortunately, Supply is run by an uncooperative bureaucracy. Fortunately, Azzie acquires a resourceful hunchback, Frike, who helps him gather the necessary body parts and stitch them together. Unfortunately,

Prince Charming proves too much of a wimp to embark on his quest. Fortunately, Azzie finds a way around that problem.

Unfortunately, there are lots more problems, ranging from a little girl with a wish to a dwarf with a yen and an angel—Heaven's official observer—with an ineffable appeal to Azzie's favorite ally, Ylith the witch. Add to this a Santa Claus with an itch only a witch can scratch, mix in a bit of Shakespearean romance, and you have some idea of what the book is like. Zelazny and Sheckley never miss a chance to make a joke, crack wise, or send up a cliché. It's the sort of thing that gets billed as uproarious comedy.

Alas, most of the yucks were so feeble that they barely made me smile. I didn't have nearly as much fun reading this one as the authors had writing it.

With **The Face of the Waters**, Robert Silverberg once again justifies his reputation as one of SF's premier writers. He also demonstrates the truth of the assertion that good SF stories tend to be morality plays as he considers the need that many people feel for something larger than themselves.

The scene of the tale is Hydros, a water world with no trace of land. The natives, amphibians known as Dwellers or Gillies, live on floating islands they have built from sea plants; there are hints early in the story that they have a sort of gestalt symbiosis with the other native creatures of their world, many of which are sentient. At one time, Hydros was used as a dumping ground for prisoners. At the time of the story, the few humans on the planet are either descendants of the prisoners or one-way immigrants from galactic society (because Hydros has no spaceport, there is no way to leave the planet). These humans

¹The authors don't say that, since the contest has been recurring for many millennia and the time of the story is 1000 AD, the birth of Jesus must have been a play in the previous round, but the implication is clear.

share the artificial islands with the Dwellers, who have been known to prune human communities that grow too large. Off Hydros, humans must also share space with other species; they have no world of their own because Earth has been destroyed, its sun gone nova.

One of Hydros's islands is Sorve. It supports a human community of about seventy people, one of whom is Silverberg's narrator, Valben Lawler, a physician who does his best despite incomplete training. Lawler is also an independent loner who is his own touchstone of value and reality; sadly, he relies on a drug he extracts from seaweed to maintain his equanimity. The other residents of Sorve include Sundira Thane, an attractive woman who has hopped from island to island all her life; she studies the Dwellers and searches for truth; Lawler is drawn to her. There is Father Quillan, a priest who has fled to Hydros in search of faith. There is Nid Delagard, owner of a fleet of inter-island ferries and trading ships, an ambitious entrepreneur who craves wealth and power; in pursuit of one of his many schemes, Delagard causes the Dwellers to tell him that in thirty days, all humans must leave Sorve. There are others too, none of them content with their lives as they are, none of them sufficient unto themselves.

As the deadline nears, Sorve's people accept their banishment. Delagard prepares his ships, each of which can take a dozen or so passengers. He radios other islands and finds that none are willing to take the entire community except . . . He tells everyone that they will go to Grayvard. But then, as the voyage continues through water shortages and storms, tidal waves and attacks by sea monsters, Lawler discovers that Delagard is leading them on a very dif-

ferent course. Their actual destination is the "Face of the Waters," an island that apparently cannot be seen from orbit even though one ancient mariner once told tales of its solid, fertile land and it plays a part in the beliefs of the Dwellers. Delagard says the refugees from Sorve will colonize it, build a spaceport, invite galactic contact, and go on to conquer both Hydros—humans and Dwellers all—and the worlds beyond.

Father Quillan half believes the Face is the actual Eden, with God in residence. Both visions of the future are grandiose enough and typically human. Neither is correct, as the survivors of the voyage eventually discover.

Silverberg seems to be saying here that people cannot find true fulfillment by themselves. They seek it in drugs, sex, ambitions, and callings, but always futilely until they surrender to some higher power. Is that power God? Perhaps, though Father Quillan's experience suggests that it cannot be God the way we usually think of God. Rather, the higher power may best be understood as a sense of the interconnectedness of things, of the symbiosis of life with itself and its environment. Damnation it is to withhold oneself from that symbiosis. To Silverberg, the One True God of Earth may be best described by Lovelock's Gaia Hypothesis.

William C. Dietz's **Drifter** is an entertaining adventure despite a very basic flaw. The hero, Pik Lando, is a clever smuggler who has just arrived at the world of HiHo with a cargo of contraband kidneys for transplant. Wendy Wendeen belongs to a religious group that, because it eschews violence, has been mistreated throughout the galaxy. It therefore scraped together enough money to buy half of Angel, a planet

that is just barely suitable for human life. The other half belongs to a giant mining corporation that wants the whole thing and is doing its damndest to force the religious colony into bankruptcy and failure. It will not, for instance, permit the colonists to import fertilizer without paying exorbitant duties.

The colony therefore needs a smuggler. As soon as Wendy meets Pik, it has one. Shortly thereafter, it also has its fertilizer and Pik is being asked to pick up a load of genetically engineered microorganisms that will destroy all metal on the planet—notably including the corporation's mining and other machinery—and make the place useless to the corporation while leaving it suitable for the colonists' agriculture.

A corporation spy soon reports Pik and Wendy at the genetic engineers' home base. The corporation doesn't know what's up, but it wants revenge for the damage Pik has already done it. The chase is on, in space, through the ruins of an abandoned Martian city, under the falling rings of Angel. In the end, of course, the good guys win, even though Pik is ultimately unable to convince Wendy that violence is sometimes essential.

The flaw? I wasn't satisfied by the ending, which shifts to a totally unconnected scene and character set apparently to pad out the book to more novelish length and set up the sequel (*Drifter's Run*, due in June), but the real problem is those metal-eating microbes. Dietz doesn't seem to think they will need an organic food supply—in short supply on Angel—for energy and growth material. He does seem to think his bugs will entirely remove all metal and metal ore from the planet when the most they can do is change the metal's chemical form. Induced corrosion may be enough to get rid of the corporation,

but it won't hurt the ore bodies a bit. And antibiotic-containing paint should stop the metal-eaters cold.

It's a fun read, but don't take it seriously.

Once upon a time, Bradley Denton tells us in **Buddy Holly Is Alive and Well on Ganymede**, humans much like us—call them the ancient Atlanteans—learned how to abandon their bodies and zoom off about the cosmos as immaterial “ships of light.” In due time, they returned and began to argue over whether modern humans should be helped along the same utopian path. The “anti-flesh” faction thinks we're too violent and dumb and should be permitted to destroy ourselves. The “pro-flesh” faction thinks our records (particularly classic rock-and-roll) show we're rather better than our record shows and is determined to prove it.

Accordingly, on the night of February 3, 1989, every TV in the world began to show Buddy Holly, with big Jupe in the background, singing, chatting, and referring questions to one Oliver Vale of Kansas. Ollie looks rather like Buddy, especially when he wears his black-rimmed specs. According to his mother's diary, he was conceived in the front seat of a 1955 Chevrolet about the time of Buddy's death, which promptly drove his unwed father to suicide. While in the womb, he got a double dose of heartbeat, both the Holly song and Mama's own. And Mama, who was deep into classic rock, ancient Atlanteans, and ships of light, swore he was Buddy's reincarnation. Naturally, Ollie—who is not surprisingly a mite hung up on Buddy Holly—freaks. He just knows the whole world is going to blame him for messing up their TV schedules and local, state, federal, and international cops will be breaking

down his door any moment now. He hops on his antique motorcycle (which may once have belonged to Buddy) and heads for Lubbock, Texas, to check out Buddy's grave (has he risen?). The neighbors, anti-fleshers there to keep an eye on him, try to stop him, but he eludes them successfully. On the other hand, Ringo, their alien-cyborg-doberman does bite a few inches off his tail-pipe and pursue him down the road at 80 per.

Meanwhile, the double-oh secret agent Richter has been assigned to find Ollie, figure out what he's up to, and end the problem. Ollie's group-therapy shrink Sharon, with her lawyer boyfriend Bruce, is setting out to find him on the way to Lubbock. Bill Willey and his fundamentalist troops have decided Ollie is the Antichrist. The motorcycle is acting up a bit. The drive-in theater occupied by the pro-flesh agents (in disguise as Eisenhower and Khrushchev) gives off attractive vibes and the Willeyites book it for a mass meeting. Couch potatoes riot in the streets. An army buddy of Ollie's brother Mike, who died in Vietnam, shows up just in time to help. Ringo learns how to swallow beer cans whole and cough them up later. Bruce reverts to savagery. And in the end . . .

If I went ahead I probably wouldn't spoil the book for you. The ending fits and pulls together and resolves and all that, but it's the getting there that's all the fun. And fun it is. Good, weird, zany fun. I enjoyed it immensely.

Spider Robinson's **Kill the Editor** is a short novel set in Lady Sally Calhahan's high-class emporium of the amatory art. As you might expect, it is rife with puns both verbal and visual (such as a certain carpenter on a crutch). It

also pays fond homage to the hard-boiled detective story and to John D. MacDonald's classic *The Girl, the Gold Watch, and Everything*. And last but hardly least, it's a breezy bit of fluff with a very entertaining raunch level.

The narrator is "Joe" Quigley, a private eye with the unique ability to see what evidence implies even when the implication is thoroughly bizarre and the frustrating inability ever to get it quite right. It is the former that gets him hired by an unsavory bigwig to hang out in Lady Sally's brothel and try to find the little man who isn't there. After the obligatory tour of Lady Sally's establishment and her philosophy of business, we learn that the problem involves instantaneous rapes and japes. Those familiar with the MacDonald book immediately recognize the *modus operandi*, and it is no surprise when Quigley recalls the gold watch too and immediately identifies the villain. The rest of the tale is devoted to discussing the proper punishment for rapists (Robinson offers interesting reasons for charging them with indecent exposure instead of rape—for one thing, "weenie-waggers" are not prison heroes) and trapping the villain.

After suitably painful success, Quigley sets out to live happily ever after with his bride(s) (the telepathic twins Arethusa, named for the orchid *Arethusa bulbosa*). The reader smiles happily and wishes that Spider would only write more such things.

Kim Stanley Robinson's last major accomplishment was his "Orange County" trilogy, consisting of *The Wild Shore*, *The Gold Coast*, and *Pacific Edge*. In the last volume, he said explicitly that he was concerned with considering the paths history can take and comparing those paths with the present

course of history. Such a comparison, of course, was just what he was doing with the trilogy, considering a single locale under the conditions of two dystopias and a utopia.

Now, just in case we thought this was just a scheme to generate three novels, he offers us **Remaking History**, a collection of shorter works that demonstrates just how extensive his concern with the paths of history really is. Some of the stories are exceedingly explicit in their statements of the theme. The title story takes as a given that the attempt to rescue the Teheran embassy hostages succeeded and considers what happens when movie makers rewrite the tale. "A Sensitive Dependence on Initial Conditions" uses the philosophy of explanation to look at how differently the bombing of Hiroshima could have happened, and at how different the consequences might have been.

Several of the thirteen other stories in the book deal with history in other ways. "A History of the Twentieth Century, with Illustrations" gives us a depressed writer who, assigned to sum-

marize our century, nearly drowns in the millions of deaths—counted in tens and hundreds and thousands of Vietnam Memorials—we have visited upon each other in the names of various causes yet nevertheless finds a path to optimism. "Vinland the Dream" reveals an ancient fraud. "Glacier" considers the constant Scrabbling of life in a Boston menaced by a glacier. Both of these stories, along with "Rainbow Bridge" and "Muir on Shasta," emphasize an environmental interest that also showed in *Pacific Edge*.

The remaining stories are "The Part of Us that Loves," "The Translator," "Before I Wake," "Down and Out in the Year 2000," "Our Town," "A Transect," "The Lunatics," and "Zurich." None are ordinary adventures. Some will outrage those who insist on scientific plausibility in their SF. A few show a fine hand for emotions and mysticism. Most root their appeal in the intellect, in being thoughtful and thought-provoking. Indeed, "Sensitive Dependence" could make an excellent addition to a philosophy course. ■

●The highest forms of understanding we can achieve are laughter and human compassion.

Richard P. Feynman

●All men desire peace, but few desire the things that make for peace.

Thomas A. Kempis

brass tacks

Dear Stan,

I was interested to read your editorial "Ex Machina" in the April 1991 *Analog*, relating to the high cost of medical bills in the USA because of high damages claims by patients. I have been a reader of *Analog* for nearly forty years, but this is the first time I have felt impelled to write to the editor.

Many years ago, because of the chaotic state of Workers Compensation Insurance in New Zealand, the government of the day introduced legislation setting up the Accident Compensation Commission, charged with introducing a system of no fault insurance covering all citizens and visitors to New Zealand. It was funded by a levy on all employers, the rate applied to an employer determined by industry risk factors. This covered all employees for both industrial and sports accidents. Cover for vehicle accidents was made by a levy on the annual registration fee, and the government paid the costs of other accidents. The right to sue for damages was removed.

Payment for time off is made at 80% of income, plus lump sum payment for permanent disability or death. Lawyers were not wildly enthused, but still seemed to earn satisfactory incomes. As far as doctors were concerned we can no longer be sued for medical misad-

venture, though we can be disciplined and fined for misconduct or, in bad cases, deregistered.

American doctors may not believe me, but the end result is that my defense insurance costs me US \$392.00 a year to insure against charges of professional misconduct, and my average fee is US \$17.00. Passage of such legislation is of course easier under the Westminster system of government than it would be under your federal system, but legislators could be interested to learn that while our system does have problems, we have the cheapest accident insurance system in any of the OECD countries.

R. B. TENNENT

New Zealand

Dear Mr. Schmidt,

I enjoy *Analog* and your editorials are always thought provoking. I liked the August article by Stephen L. Gillett, Ph.D. ("Refueling a Rundown Planet"). However it seems to me that he ignored one source of heat input to the planet. Or was it just too small to mention? That is the heat generated in the Earth by movements caused by tidal forces.

I also conclude from viewing the patterns of currents in the oceans on a globe that the driving force of the ocean currents is not so much thermal as tidal. There is a large swelling of the ocean that moves from east to west—it seems impossible that this could do anything other than drive currents that would move from east to west at the equator. The result of this should show up at the Panamanian peninsula with the water on the Atlantic (or Gulf) side being higher than the waters of the Pacific. Yet he made no mention of these tidal forces but instead implied that the circulation of the currents would cease because they would no longer be driven by the thermal differences.

Perhaps Dr. Gillett assumed that the Moon would have receded so that it would no longer have any tidal effects on the Earth; why not include this in his article? It also seems to me from observing the tidal effects on the oceans that there must be similar tides in the atmosphere. With the chief difference being that the continents do not block the tidal flow of the air from east to west around the Earth. Then there must be some flow around the lump of air that moves around the Earth from east to west; creating a return west to east flow nearer the poles.

Why haven't I seen these tidal effects described in books or articles about ocean currents or weather?

VICTOR HATCH

Oak Grove, OR

Dear Sirs,

In reference to Stephen L. Gillett's article "Refueling a Rundown Planet": Dr. Gillett dismisses neutrinos as a means for heating a planet's interior because "a single neutrino has a good chance of penetrating a light-year of lead unscathed."

This bit of common wisdom is an oversimplification. The cross section for the interaction of a neutrino with matter increases rapidly with the energy of the neutrino. In the trillion electron-volt range, the mean free path of a neutrino in solid matter becomes comparable to the radius of the Earth. In the 1980s it was proposed that a giant floating accelerator be built to make neutrinos do a "CAT scan" of the Earth. This wasn't really practical then, but it shows that neutrino heating of the Earth requires no new physics.

I am also disappointed that Dr. Gillett did not explore other schemes for heating a planet. I can think of several, some of which require no new physics:

1. Transporting energy into the

planet via seismic waves. A globe-spanning array of seismic transmitters, perhaps located on seafloors, should be capable of transmitting terawatts of power into the planet. By using phased array techniques, it should be possible to concentrate the energy where desired, causing local heating.

2. Tidal heating. We might swing a series of large asteroids past the Earth. The tidal deformation of the Earth would deposit energy. For this to be feasible, the energy released at the surface must be small; no sense in swamping the continents under tidal waves.

3. Chemical heating. It might be possible to sink chemicals into subduction zones that would react at depth, releasing heat. For example we might sink strongly oxidizing compounds in one place, and reduced compounds at another. The quantities of reagents required may be impractical.

4. Heating via miniature black holes. A (very small) black hole would produce energy as it spiralled into the core by means of Hawking radiation, radiation from accreted matter, or by dissipation of its kinetic energy. Injection of several black holes into the core could cause holes to coalesce there, liberating additional energy.

5. Monopole annihilation. Magnetic monopoles, if they exist and can be manufactured, could be released into subduction zones. They would tend to follow magnetic field lines to the core, where north and south monopoles would annihilate. They might also "short out" the magnetic field in the core, however. Another scheme would be to use a superconducting coil around the Earth to force monopoles to travel repeatedly through the core, dissipating energy.

I also question the need to heat the Earth. Would it not be more efficient to recycle sediments and nutrients back

onto the continents directly, or, for that matter, to disassemble the planet into independent colonies of much larger surface area? Gravity is such a mass-inefficient way to keep one's feet on the floor.

PAUL F. DIETZ

Dept. of Computer Science

U. of Rochester

Rochester, NY 14627

The author replies . . .

Dear Stan:

Mr. Hatch brings up several interesting points. First, tidal effects do exist, even in the atmosphere, but they don't amount to diddly-squat. In particular they don't affect thermal stratification. To get overturn—vertical circulation—you need density differences, and tides don't do that. Moreover, those east-to-west currents in both the oceans and the atmosphere are driven by the Coriolis force—i.e., by the effect of Earth's rotation—not by the tides.

Tides also occur in the solid body of a planet, and they *can* cause internal heating due to friction as the planet is flexed. This is also negligible in the Earth, but Io shows that it can be very important. So, another thought experiment for really far-future technology: set up something in close orbit to heat the Earth by tidal flexure! The heating will depend critically on Earth's viscosity, which determines the rate of energy loss.

I'll leave this one as an exercise for the reader. I'll just note that you'll have to maintain the orbit of the object, since it'll be decaying because of the energy losses! You'll also have to be careful not to brake Earth's rotation too much. Last, of course, there could be one awkward side-effect: giant oceanic tides rolling over the continents will severely impact the Earth's habitability, not to mention that their erosion will tend to flatten the Earth into the smooth billiard

ball we're trying to avoid . . .

This tidal possibility was also mentioned by Mr. Dietz, but I also applaud his devising even more thought experiments. I wrote the article to stimulate discussion, not to provide the definitive answer to what, after all, is hardly an imminent problem! I just have a few comments: You'll probably have a lot of trouble with phased-array seismics, because the Earth is heterogeneous and also has very low Q, at least by comparison with what engineers are used to. Energy dissipation is going to be hard to localize!

Chemical heating might be possible by dropping oxidizing agents down subduction zones, because the Earth's interior is highly reduced already. One problem is that you might change the chemistry of the mantle. You're likely to get new phases, which would affect the density of the mantle, which would in turn affect volcanism, continental stability (via isostasy), and possibly even plate tectonics. This won't happen right away, but we're talking geologic time here! Of course, you'll also need a *lot* of reagent, too.

The black hole notion is interesting; but it means that sooner or later (sooner as geologists look at things) you won't *have* an Earth! David Brin explored this a bit in his recent novel *Earth*.

Finally, of course, the advantage of habitable planets is that they're self-maintaining over geologic time. Thus it's interesting that it seems we're going to have to take over Earth's maintenance, sooner or later. . . .

STEVE GILLET

Dear Dr. Schmidt,

Regarding your August editorial "Continuity," where you warn of the dangers of data loss through incompatibility of data formats: I've experienced the same thing, but the situation is get-

ting better. However, it's interesting that the reasons things are getting better have little to do with the desire to keep access to obsolete formats.

When we changed from an Apple II to a Macintosh in 1986, I lost access to my accumulated correspondence files for the previous 3 years. My wife lost access to her recipe files. Now we are in the process of converting from the Macintosh to a NeXT computer. Neither of us will lose anything this time, nor will we be forced to rekey anything.

The reason for this is the growth in Local Area Networks (LANs). These networks tie together diverse types of computers in a single office or company. In many divisions and companies, it is now politically impossible to buy a computer that cannot be connected to the existing company network. Because the computers are tied together, customers are starting to insist that their accumulated data be accepted by any new computers that are added to the network. This leads to programs that read files from other programs, and a booming industry in file format translation programs. In a company with a LAN, it is likely that no data files will be obsoleted ever again.

So, we now have economical solutions to the problem. But the solutions arose as a side effect from the need to access files from different types of computers connected to the same net, not from the need to read old files from obsolete computers.

I've heard people (probably English teachers) say that the reason English hasn't changed much in the last 400 years is because that would make Shakespeare obsolete, and no one would be willing to give him up. With CD-ROMs and large disk drives, we may have such a critical mass of information on-line now.

I just wish there was something simi-

lar I could do with my 400-odd LPs.

PAT MCGEE

Chimayo, NM

Well, I would never advocate such a thing, but you could copy them onto cassettes. . . . (Last I heard, LP players were still available.)

Dear Stan:

Regarding Tom Easton's review of Charles Platt's *The Silicon Man* (August 1991). I am eager to read this novel as a result of this review. However, I believe that Mr. Easton's criticism that the novel does not exploit the effect of CPU usage might not be totally accurate.

In a virtual reality situation where multiple virtual people are residing concurrently, none of these virtual people need be aware of CPU performance degradation as additional virtual people "immigrate." This mode of operation is known as multitasking, and large mainframe computers have been doing it for years. While the CPU will process fewer virtual seconds in relation to real seconds as more virtual people are added, those virtual people will not perceive any difference of "slow down" in virtual time as a result. True, the real people outside will observe the virtual people inside moving in slow motion. But the only difference that will be perceived by the virtual people will be that time in the real world will seem to have speeded up. For example, if a virtual person on a heavily loaded CPU switches his virtual TV to a channel being fed live by a real video camera in the real world, he would see a scene which looks like a fast forwarding movie. He would not consider himself to be moving in slow motion.

Of course, it's possible that the virtual community might consider this an adverse effect and opt to invest in more MIPS, especially if the situation gets so extreme that a year of real time must

pass for every second of virtual time, but that is a political/economic decision on their part rather than a technical one.

BERNIE GALLAGHER

Somerset, NJ

Dear Stan:

I hesitate to quibble with a review so favorable and generally perceptive as Tom Easton's of my *Stations of the Tide* (September 1991). But it contains an error of fact which I must correct.

The "M. C. Porter Endowment for the Arts" I mentioned in the acknowledgements page is a joke. Marianne Catherine Porter is my wife. And while she supports my career emotionally, intellectually, and sometimes even financially, she does not give grants.

As for the distinction between "literary" and "commercial" fiction . . . I receive no foundation money whatsoever, worse luck. I don't have a day job. I live entirely on what I make from writing. So I guess I must be commercial. Certainly I write for the reader's enjoyment rather than to some abuse academic standard. I'm gratified that Tom thinks my book is finely crafted, but I have to admit—here, where I'm among friends—that the reason it can be a long wait between my novels is that I tend to be a *slow* writer. There are days, indeed, when my beloved Endowment for the Arts, anxious to discover how the latest work will turn out, fixes a hard stare at me and snaps, "Type faster, Swanwick!"

Good advice. I'll try to take it to heart.

MICHAEL SWANWICK

Dear Dr. Schmidt,

It was rumored that Dr. Asimov is well past his prime as a writer, and makes his living selling his name like an aging pro athlete.

But then he gives us "Gold."

It was rumored that a heart problem has left him so frail that he can hardly

speak or walk, let alone write.

But then you published "Gold."

It was rumored that he presided over the abandonment of science fiction in favor of inconsequential light fantasy wherein no inconvenient fact need worry a politically correct story.

But then he wrote "Gold."

True, the most persistent rumors anchor themselves to little bits of something more solid, but the nature of these rumors must be like the ten-story smoke plume of an old steam engine; the engine headed one way and the smoke wind-blown in some other direction.

I've heard the rumors. I've read "Gold." I prefer to believe what I read.

In one story we have a realistic future of drama, an allegory of conscience in science presented as a drama in work, a ringing defense of science fiction as art, and a symbolic O. Henry ending as poignant as they come. It doesn't get any better than this:

GERALD D. NORDLEY

Dear Stan,

In the September 1991 "Biolog," Jay Kay Klein wrote ". . . For centuries, female characters mainly fetched refreshments, are fought over, or are brutally assaulted. When this magazine was forging modern science fiction in the thirties and forties, it had only two major women writers. E. M. Hull wrote about the manipulative male Artur Blord, and C. L. Moore about the very macho Northwest Smith."

Whoa!

Northwest Smith never appeared in *Astounding*; except for two stories in fanzines, *Weird Tales* was his home. C. L. Moore contributed at least two stories to *ASF* with very strong female protagonists: the novel *Judgment Night* (August, September 1943) and *No Woman Born* (December 1944).

LEO DOROSCHENKO

West Orange, NJ

a calendar of
analog
upcoming events

27-29 March

MIDSOUTHCON 11 (Mid-South SF conference) at The Memphis Airport Hilton, Memphis, Tenn. Guest of Honor—Nancy Springer, TM—Margaret Weis, Artist Guest—Beth Willinger, Fan Guest—Belinda Anderson. Registration—\$20 until 1 March, \$25 thereafter. Info: MidSouthCon 11, Box 22749, Memphis TN 38122. (901) 274-7355 or (901) 382-1731.

17-20 April

ILLUMINATION (43rd British National SF convention) at Norbreck Castle hotel, Blackpool. Guest of Honour—Paul McAuley and Geoff Ryman, Fan Guest of Honour—Pam Wells. Registration—£20 attending, £12 supporting. Info: Steve & Alice Lawson, 379 Myrtle Rd., Heeley, Sheffield S2 3HQ, England, U.K.

17-20 April

DISCONTINUITY (Auckland SF convention) at Allenby Park Motor Lodge, Papatoetoe, Auckland, New Zealand. Guest of Honour—Terry Prachett, International Fan Guest of Honour—Maureen Thomas, Local Fan Guest of Honour—Peter Hassell. Held in conjunction with Rolecon '92—the New Zealand national role-playing competition. Registration—\$NZ20 supporting, \$NZ40 attending. Info: Post Office Box 74013, Market Road, Auckland, New Zealand.

17-19 April

BALTICON 26 (Baltimore-area SF conference) at Marriott Hunt Valley, Hunt Valley, Mdr. Registration—\$25 until 31 December 1991. Info: Balticon 26, BSFS, Box 686, Baltimore MD 21203.

1-3 May

PHOENIXCON/DeepSooth Con 30 (Deep-South SF conference) at Atlanta, Ga. Guest of Honor—Joe R. Lansdale, Artist Guest of Honor—Alan M. Clark, Fan Guest of Honor—Marilyn Teague, TM—Charles L. Grant. Registration—\$25 until 15 April, \$30 thereafter. Info: DeepSouthCon 30, 1579-F Monroe Drive, #218, Atlanta GA 30324.

23-26 May

92nd A.B.A. Convention and Exhibition at the Hilton, Marriott and Convention Center, Anaheim, Calif. Open to the trade only. Info: American Booksellers Association, 137 West 25th St., New York NY 10001.

3-7 September

MAGICON (50th World Science Fiction Convention) at Orange County Civic & Convention Center, Orlando, Fla. Guest of Honor—Jack Vance; Artist Guest of Honor—Vincent Di Fate; Fan Guest of Honor—Walter A. Willis. Registration—\$95 adult/\$45 child until 31 March 1992; \$110 adult/\$55 child until 15 July 1992; \$135 adult/\$75 child at the door. Supporting—\$25. This is the SF universe's annual get-together. Professionals and readers from all over the world will be in attendance. Talks, panels, films, fancy dress competition—the works. Join now and get to nominate and vote for the Hugo Awards and the John W. Campbell Award for Best New Writer. Info: MagiCon, Box 621992, Orlando FL 32862-1992. (407) 275-0027. UK agent Peter Weston, 72 Beeches Drive, Erdington, Birmingham B24 0DT UK.

29 October-1 November

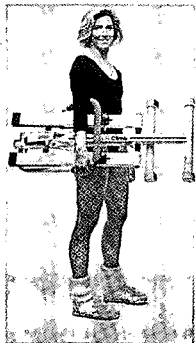
WORLD FANTASY CONVENTION at Callaway Gardens, Pine Mountain, Ga. Limited membership. Registration—\$100 in advance. Info: World Fantasy Convention 92, Box 148, Clarkston GA 30021. (include SASE)

Items for the Calendar should be sent to the Editorial Offices six months in advance of the event.

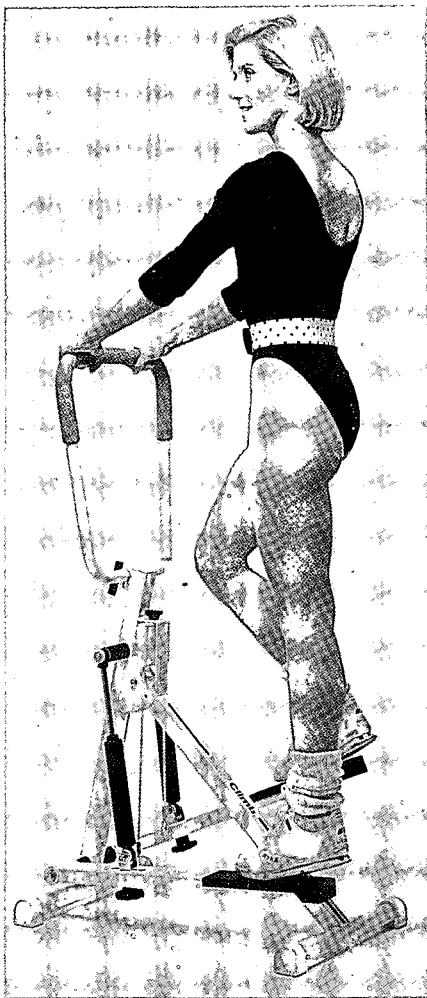
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